

THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer • TRANSPORT • The Railway News
The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.
RAILWAYS • ESTABLISHED 1835 • RAILWAY OFFICIAL GAZETTE

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1.

Telephone: WHItchall 9233 (12 lines). Telegrams: "Trazette Parl, London"

BRANCH OFFICES

GLASGOW: 87, Union Street Central 4646
NEWCASTLE-ON-TYNE: 21, Mosley Street . . . Newcastle-on-Tyne 22239
MANCHESTER: Century House, St. Peter's Square . . . Central 3101
BIRMINGHAM: 90, Hagley Road, Edgbaston . . . Edgbaston 2466
LEEDS: 70, Albion Street Leeds 27174
BRISTOL: 8, Upper Berkeley Place, Clifton . . . Bristol 21930

Annually £4 10s. by post. Single copies, Two shillings.

Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 100]

FRIDAY, APRIL 9, 1954

[No. 15

CONTENTS

397A

Editorial Notes	397
Proposed Fare Increases in London	399
Managerial Reorganisation of the E.A.R. & H.	399
Canadian Pacific Railway	400
Burma Railways	400
Railway Operating Economies	401
U.S.A. Railway Wagon Hire Settlement	401
Letters to the Editor	402
The Scrap Heap	403
Overseas Railway Affairs	404
International Railway Congress, London, 1954	405
Remote Control of Points and Signals, etc.	406
The Yonge Street Subway, Toronto	408
New Wickman Chucking Automatics	413
Personal	415
News Articles	418
Contracts and Tenders	421
Notes and News	422

A Dissappointing Budget

THE Budget statement by Mr. R. A. Butler last Tuesday was disappointing in two respects to the transport industry of this country and to the industries supplying material to railways at home and overseas. From the railway viewpoint, as from that of the private individual, the Budget confers little benefit or disadvantage. There is to be no reduction in the fuel oil tax, with its far-reaching effects on road transport and on industry: it is estimated, for instance, to cost the British Transport Commission nearly £19,000,000 a year. Nor is industry to have the incentive of a reduction in the standard rate of taxation, or any abolition of the tax on undistributed profits. On the other hand, the Chancellor of the Exchequer has given encouragement to productive investment in the new system of investment allowances, which is to replace the present system of initial allowances. The latter have the effect of an interest-free loan and reduce depreciation allowances in future years, whereas the new allowances will give similar help in the first year in which the investment is made, and will be given in addition to the full annual depreciation allowances. This step should go some way to encourage action designed to improve the efficiency of British industry in competing in overseas markets. Help for exporters of capital goods is

being given by allowing the Export Credits Guarantee Department to make more liberal use of guarantees to the banks on major capital goods exports. One handicap under which British exporters have been working is difficulty in financing the credit that foreign buyers have expected in order to place their orders in Britain. The new concession should help here, in competition with foreign countries and notably Germany, where exporters seem able to obtain more ready help in this respect. Competition in overseas markets for capital goods, including railway material, is becoming keener with the resurgence of industry in Germany and Japan and assistance in financing credits may turn the scale in the decision to place orders in this country.

International Railway Congress Programme

THE programme of functions, business sessions, and technical visits arranged for the International Railway Congress in London next month shows the wide scope of the congress and the many different aspects of British railway and associated activities in their latest and most developed forms including the urban electric railways of London Transport, and Southampton Docks—the latter very largely the creation over the years of private railway enterprise—which delegates will be able to see for themselves. Some details are given on another page. The importance attached to the gathering by high authority in this country is shown by Royal patronage—H.R.H. the Duke of Gloucester, Honorary President of the Congress, will perform the opening ceremony; Mr. Alan Lennox-Boyd, Minister of Transport & Civil Aviation, will attend the principal functions and close the final session; and delegates are invited to attend a reception by H.M. Government. The extent of British participation is seen in the attendance as office bearers, reporters, and delegates, of many prominent railwaymen both from the United Kingdom and countries of the British Commonwealth overseas. Besides this, British industry will display its most recent products to delegates from overseas who profit by the opportunity offered to visit industrial plants.

Railway Wages

A MEETING between the Chairman of the British Transport Commission, Sir Brian Robertson, and representatives of the three railway trades unions, the National Union of Railwaymen, the Associated Society of Locomotive Engineers & Firemen, and the Transport Salaried Staffs Association was held last Wednesday to discuss the wages structure of the railway industry. Examination of the railway wage and salary structure jointly by the Commission and these three unions with a view to correcting anomalies, giving added incentives, including differentials, and investigating all standard rates of pay, was a condition of the wages settlement last December. Since then there has been a deadlock in the discussions between the Commission and the unions, which disagree on the approach to the problem. A request for a meeting with Sir Brian Robertson was made by the N.U.R., which maintains that any reasonable wages structure depends on a satisfactory minimum rate being agreed as a first step. Meanwhile the A.S.L.E.F. last Friday announced a strike by its members from April 24 unless the Commission revealed its proposals for a revised wages structure. As we went to press, the meeting was discussing this and other aspects of the railway wages problem.

Railway Catering Problems

THE contrast between rising profits from remodelled refreshment rooms and falling receipts from restaurant cars was the dominant feature of a paper on catering in relation to transport given by Mr. E. K. Portman-Dixon, Chief of Restaurant Cars & Refreshment Rooms, British Transport Hotels & Catering Services, to the Metropolitan Section of the Institute of Transport recently. He traced the historical development of transport catering from coaching inns to the present day, mentioning that railway refreshment rooms pioneered the bar counter which has been copied all over the world. The cafeteria system is being developed and has shown very good results, being obviously

in accordance with the public taste. Catering services in the "Starlight Specials" were provided last season by the refreshment rooms, as the restaurant car department was unable to provide sufficient staff. Dining-car service has been improving, but the present high prices, though comparing favourably with similar services elsewhere, do not fit in with consumer demand. A changed technique is required, Mr. Portman-Dixon believes, and, if necessary, two levels of service must be provided in some trains. The first fleet of 27 cafeteria-restaurant cars is under construction, and the task of surveying every service carrying a restaurant car is well advanced.

Rapid Transit in Toronto

IN planning and building its new Yonge Street underground line, the Toronto Transit Commission was able to draw on the experience and practice of the gradually increasing number of large cities operating rapid transit services. The result is a railway embodying the best features of modern technique in underground layout and operation but still distinctive in character. Cut-and-cover construction beneath a large city is bound to entail some disruption of its business activity, and needs much skill if public utility services are to continue to function normally, but by careful programming and the possession of only short sections of roadway at a time, the Commission seems to have reduced it to the minimum. It also claimed the forbearance and interest of Torontonians by issuing a series of illustrated folders describing the progress of the work. Deep-level tunnelling was decided against for various reasons, of which one of the most important was the wish to site the stations so as to allow rapid passenger interchange between the subway and surface transport. The railway, described elsewhere in this issue, is now in full operation and greatly relieving traffic congestion. Of the important contribution which it has made to its equipment British industry can be proud.

Cheaper Rail and Sea Travel to Paris

THROUGH reduction by British Railways of the boat train fares between London and Dover or Folkestone and by the French National Railways of their train fares between Calais and Paris the first and second class return fares from London to Paris by the Short Sea routes will be reduced by £1 10s. and 16s. 8d. respectively as from May 1—in time for the summer holiday traffic. There will be reductions also on the Newhaven/Dieppe and Southampton/Le Havre routes. Various factors, such as the inclusion of refreshments in air fares, invalidate comparison between air and surface passenger fares, but the reductions in railway fares should attract first and second class railway traffic, which has been feeling the impact of air competition. They bring to an end the practice, dating back many years but believed never to have obtained with other packet ports, of charging special boat train fares between London and Dover and Folkestone, based partly on the necessity to pay a toll for working the Dover boat trains on harbour premises not owned by the railway.

Realigning an Indian Main Line

THE North-East main line of the Central Railway of India (former Great Indian Peninsula Railway) from Bombay to Delhi crosses the Vindhya Mountains between Itarsi and Bhopal. This line conveys traffic between Bombay and Central and South India on the one hand, and Kanpur, Lucknow, Agra, Delhi, and the North West on the other. Hitherto the section from Budni to Barkhera has been single line, and climbed the 530 vertical feet between these stations with a ruling gradient of 1 in 80. This entailed considerable banking and so limited the capacity of the section. To have doubled the line in the ordinary way would have been merely a palliative, and so a thorough survey of the area was carried out with the idea of constructing a second track for ascending traffic with a considerably easier gradient to eliminate or reduce banking

and greatly increase line capacity. By developing several additional miles of length it was found possible to achieve this object and build a 1 in 125 ascending line. The mountainous terrain made this a costly undertaking, involving a $\frac{1}{4}$ -circle spiral, four tunnels with an aggregate length of 2,447 ft., six major and 75 minor bridges, the moving of 68,100,000 cu. ft. of earthwork, and the building of 2,500,000 cu. ft. of concrete and masonry. The estimated cost of these 16.1 miles of new single 5 ft. 6 in. gauge line was about £1,950,000. The work was carried out with modern earth-moving and earth-consolidating plant and tunnelling methods.

The First Tunnel in Rhodesia

AN avoiding line being built at the colliery centre of Wankie in Southern Rhodesia, on the main line between Bulawayo and the north, will include a tunnel between 800 ft. and 900 ft. long, the first to be driven on the Rhodesia Railways. It will be concrete lined and on a gradient of 1 in 120 and pass under a hill 160 ft. high. The deviation is about eight miles long and is being constructed to relieve the congestion at Wankie and avoid the steep gradient just south of the yards. The survey has been completed, the line pegged, and a start made on culverts and earthworks, which will include considerable embankments. The new line will improve working over the route, which is the only southern outlet from Northern Rhodesia and carries heavy mineral traffic. Work is already far advanced on another project with the same object, a deviation between Wankie and Dett, in the Bulawayo direction, involving 45 miles of new line; this section carries much coal traffic originating from Wankie in addition to that from the Northern Rhodesia copperbelt destined for the South.

Drawgear and Diesels

THE statement "that the main thing a very high starting tractive effort does is to break couplings," made in "Modern Railway Motive Power," published in this country four years ago, is confirmed in a report to the Air Brake & Railway Fuel and Travelling Engineers Associations in U.S.A. The author, Mr. A. M. Malmgren, Diesel & Air Brake Supervisor of the St. Louis-San Francisco Railway, writes: "No small part of road damage (to cars) is caused by the tremendous pulling force of modern diesel power. The tensile strength of a new modern centre coupler without defect is 250,000 lb.; yet a four-unit freight diesel develops 248,000 lb. starting tractive force. Couplers therefore are not just yanked out—they are stretched out starting heavy trains, and the situation is aggravated on the older, weaker cars in the train." Official reports of the tests on the first four-unit 5,400-h.p. freight diesel in the U.S.A., during 1940, stated that usually when a drawbar pull in excess of 175,000 lb. was attained, a coupler somewhere in the train would fail; and that the limiting factor of this locomotive was the capacity of the drawgear of existing stock. The same is true in all countries and with all stock and there might be some benefit in freight locomotives by deliberately limiting the starting effort to 25 per cent adhesion, but having that value available up to 8 or 10 m.p.h.

Chromium Plating of Motion Parts

A USEFUL technique is being developed in modern locomotive maintenance in the chromium plating of bearing surfaces of motion parts. The life of the part is increased considerably, and there is economy in labour also if a part which takes much time to dismantle and re-install in this way needs less frequent replacement. At a temperature of 130 deg. F., and with a current of 3½ amp. per sq. in., a hard chrome solution will deposit 0.001 in. thickness in 50 min.; with a variation in composition, and the same current, the depth of deposition can be increased by 50 per cent. The Norfolk & Western Railway, U.S.A., is now applying the hard chrome plating treatment systematically

to cylinder bushings, piston heads, brake heads and various other types of pins, cups for crankpin roller bearings, and so on. Some of the cups just mentioned, in service on one of the Norfolk & Western Railway "J" type 4-8-4 locomotives, which are very intensively used, after six months' service showed a wear of 0.002 in. only, as compared with the 0.055 in. of wear of unplated cups on the opposite side of the same locomotive. The life of other wearing parts has been increased by four to five times in the same way.

Proposed Fare Increases in London

THE announcement by Sir John Elliot, Chairman of the London Transport Executive, that the British Transport Commission has asked the Transport Tribunal to approve a further increase in passenger fares in the London area is not unexpected. The increases apply to ordinary single fares on London Transport rail, bus, and trolleybus services and also to the London, Tilbury & Southend Line of British Railways, Eastern Region. Early morning fares and season tickets are affected on all services, including British Railways, in the London area, and also day return tickets by British Railways within that area. Details of the proposed changes are given elsewhere in this issue. The changes will not affect fares outside the London area. Thus a considerable element of British Railways passengers completing their journeys within the London area are to share with London Transport travellers in the increases.

An increased revenue of some £5,000,000 a year is expected to result if the proposals come into force and this is the extent of the gap between receipts and the figure needed to enable the London area to make its proper contribution to central charges. Application has already been made to the Transport Tribunal under the procedure prescribed by the Act of 1947, and it is thought that the public inquiry may be held in May. If successful, the increase in fares will probably take effect in the Autumn. Despite every effort to achieve economies, Sir John Elliot has stated, the present fares are not covering the cost of providing the service. London Transport fares are now about 78 per cent above prewar levels, and this will rise to 94 per cent if the proposed increases are granted. Costs have risen by 140 per cent.

The main causes of the gap are the recent increase in wages amounting to some £3,000,000 a year in the London area, and a further £500,000 for such items as higher coal, and increased pension costs. Since 1948 the artificially high postwar travel boom has gradually declined and the growth of private motoring is causing a fall in the number of passengers using public transport. Television, as Sir John Elliot has pointed out, has created a habit of staying at home instead of going out at weekends and in the evenings. For these and other reasons there has been a decline of about £1,250,000 a year in London travel over the past 14 months and this decline is likely to continue.

Substantial economies have been made by the Executive. Since 1948 the staff has been reduced from 101,000 to 96,000, representing a saving of £2,000,000 a year in wages. From 1951 every opportunity has been taken to reduce mileage. About 21,000,000 car miles a year have been saved with a consequent reduction of £200,000 in fuel costs. A further £400,000 has been saved by the use of thinner oils on buses.

Although a substantial saving could be made by reducing the frequency of peak-hour services, it is at these hours that services must be maintained, and the British Transport Commission has a clear duty to perform under its monopoly of public transport in the London area. Cheap fares outside the peak-hours have often been suggested as an incentive to travel, but the careful appreciations which have been made of their probable effect show that it is unlikely that sufficient extra journeys would be made to cover the loss of revenue on the existing volume of traffic which would result.

Managerial Reorganisation of the E.A.R. & H.

IN an editorial article published in our June 26, 1953, issue on the retirement of Mr. Alfred Dalton, the then General Manager of the East African Railways & Harbours administration, an outline was given of the work achieved in recent years by that system, and an attempt was made to present the complexity and extent of the business undertaken. At that time, much publicity was being given to complaints made by the system's users regarding congestion and consequent hold-up of goods in transit occurring at the port of Mombasa.

Our previous article, which traced the growth in traffic handled by East African Railways & Harbours through increased efficiency and as a natural result of the amalgamation of the Kenya & Uganda and Tanganyika railway and harbour systems, presented a main cause of this congestion. Immediate and effective action was obviously necessary and the Transport Advisory Council which had investigated prevailing conditions suggested certain steps to effect improvements by means of managerial reorganisation.

In the past, the General Manager has been unable, by reason of the extreme pressure of his duties, to absent himself from headquarters for more than relatively short periods. This has inevitably resulted in a great loss of the personal contact so essential between prime movers in contracting parties. To alleviate this position, and to promote the spread of responsibility throughout the system, the East Africa High Commission, with the approval of the Secretary of State and acting on the recommendations of the Transport Advisory Council, has created several new posts and widened the scope of others.

The new position of Deputy General Manager and the development of the former position of Principal Assistant to that of Chief Assistant, carrying with it enhanced status, will strengthen the management so that it may deal more effectively with the continual expansion which is taking place in the administration's services throughout East Africa. Mr. W. Urquhart, O.B.E., M.Inst.C.E., who will take office as the first Deputy Manager of the system on his return from leave in the United Kingdom in August, has been Chief Engineer of East African Railways & Harbours for the past two years. Mr. G. P. G. Mackay, Principal Assistant since 1948, takes up his new duties as Chief Assistant immediately.

The existing position of Superintendent of Ports & Lights will be superseded by the new post of Chief Ports Manager. This office, which carries with it administrative charge of all East African seaports and responsibility to the General Manager for the efficient operation of all ports and for the development of a progressive policy of port development, ranks equal to that of the head of the major departments of the Administration. An appointment to the new post is expected before the retirement of Captain C. W. Hamley, O.B.E., Superintendent of Ports & Lights, in October next.

Another appointment yet to be made will be that of Ports Assistant to the General Manager at Headquarters. The holder of this office will advise the management on technical ports, and will rank at Deputy Head of Department level.

The efficient ordering of day to day affairs concerning the E.A.R. & H. in Tanganyika is to be the responsibility of another enhanced position, that of Regional Representative, Dar-es-Salaam. This post, which grows out of, and supersedes, that of the Regional Officer, will also rank at Deputy Head of Department level, and will be filled by Mr. C. W. Leverett, the present Regional Officer. Certain operating duties now forming part of the responsibilities of the Regional Officer will be covered by the newly-created post of District Traffic Superintendent, Dar-es-Salaam.

It is interesting to notice the spread of greater regional and departmental autonomy on the East African system which is taking place at the same time as a similar tendency is developing on British Railways, although for different reasons. The spread of effective management over a wider sphere which is to be the result of the new E.A.R. & H.

developments has been instituted to meet a growing burden of work which is recognised by everyone familiar with the problems of the system. No doubt the experience of other transport systems in dealing with a rapid expansion of traffic under modern conditions has been studied and borne in mind by the Transport Advisory Council in East Africa.

Canadian Pacific Railway

THE volume of freight traffic carried by the Canadian Pacific Railway in 1953 was second only to that of the previous year. Gross earnings of railway operations were higher than ever before as a result of increases in freight rates which became effective early in the year. Although the reduction in traffic volume was fairly general and was particularly marked towards the end of the year, there were important increases in some commodities. The carryings of grain and grain products declined despite the harvesting of one of the largest grain crops in Canadian history.

In his annual report for the year ended December 31, 1953, Mr. W. A. Mather, President, Canadian Pacific Railway, says that mounting wage costs and the failure to achieve the traffic volume which had been hoped for at the beginning of the year made it necessary, by the middle of the year, to curtail maintenance expenditures and so defer part of the maintenance work which it had been planned to undertake. Nevertheless, working expenses increased by an amount sufficient to overtake the increase in gross revenues. Net earnings from railway operations were therefore at the same level as in the previous year, and thus, again, far from sufficient to provide a fair return on investment. Some of the principal results were:—

	1952	1953
	\$	\$
Passenger revenue	38,958,376	37,210,362
Freight revenue	376,858,445	389,443,857
Miscellaneous—		
Gross revenue (incl. taxes)	457,808,969	470,571,371
Working expenses	428,878,189	441,686,799
Net earnings	28,930,780	28,884,572
Other income	22,651,775	16,802,051
Fixed charges	12,504,010	14,236,161
Net income	39,078,545	31,450,462
Dividends	23,766,846	23,841,060
Balance	15,311,699	7,609,402
Operating ratio (per cent)	88.6	89.42

Because of the long-continued failure of railway earnings to meet current needs and of the necessity of maintaining the ability to attract new capital, the company, again in 1952, requested the Board of Transport Commissioners to establish the net investment in the railway enterprise as a rate base and establish a fair return on it. In its judgment of February 15, 1954, in respect of this application, the Board denied a general increase in freight rates and rejected the rate of return on investment as the sole basis of deciding applications for general increases. The judgment established the net investment in railway property, and its use as one of the "end" tests with respect to permissive net rail earnings.

A total of \$86,000,000 was spent on additions and improvements to railway properties. Every effort has been and is being made to continue the programme of modernisation which has produced substantial economies in operation. Gross earnings, in continuance of the unbroken upward movement since 1946, reached a new record of \$470,600,000, exceeding those of 1952 by \$12,800,000. The increase came almost entirely from freight revenues which, because of higher freight rates, provided a record proportion of 83 per cent of gross earnings. Freight traffic in ton miles was five per cent below the 1952 peak. Passenger traffic decreased 4.5 per cent in terms of revenue passengers carried and 4.1 per cent in revenue passenger miles. Working expenses, \$441,700,000, were higher than in any previous year, and exceeded those of 1952 by \$12,800,000, principally because of increases in general wage costs and in prices of materials.

Way and structure repairs included the laying of 536 miles of new rail, all 100 lb. or over, and the relaying of 507 miles, the laying of 2,700,000 sleepers, and the ballasting of some 742 miles of line. Since 1939, the

percentage of main track mileage with rail of 100 lb. or over has increased to 50 per cent. Some 700 steam locomotives were overhauled, and periodic repairs carried out to 103 diesel-electric units and general repairs to 38,266 wagons and 999 coaches.

The ratio of transportation to total operating expenses declined to 43.9 per cent from 45.5 in 1952. The increased use of diesel power contributed to improvement in operating efficiency and new high averages of train speed and gross ton miles per freight train hour. There was a drop of 11 per cent in the man-hours per freight train mile of train and engine crew overtime. Net earnings from railway operations, at \$28,900,000, were down \$46,000 from 1952. The ratio of net to gross earnings fell from 6.3 per cent to 6.1. With only two exceptions, this was the poorest ratio in the history of the company.

Net income, after fixed charges, at \$31,500,000, was down \$7,600,000. Capital expenditure on rolling stock was \$71,000,000, of which \$45,000,000 was for wagons, \$10,000,000 for passenger stock and \$15,000,000 for diesel-electric locomotives.

With the acquisition of 73 diesel-electric units the conversion of all services from steam to diesel-electric motive power on the Kootenay and Kettle Valley Divisions was completed, and diesel locomotives were put on to passenger services between Medicine Hat and Vancouver. During this year, 4,871 wagons were placed in service, bringing to more than 26,000 the total completed since the beginning of 1947. A substantial improvement in passenger train services followed the acquisition during the year of 130 new coaches of which 40 were lightweight suburban coaches, and 40 were baggage and express cars replacing obsolete wooden coaches. "Dayliner" passenger services with four new Budd self-propelled air-conditioned diesel railcars were introduced and well received.

Automatic block signal systems were extended by 183½ miles, bringing to 2,867½ the total miles so equipped. The company joined with Canadian National Railways in two new communications undertakings. In one, circuits and equipment are leased to the Department of Transport for the operation across Canada of a weather map facsimile service. In the other, microwave radio relay systems are being constructed to provide television network services between Toronto, London and Windsor and between Montreal and Quebec.

The appropriation for new rolling stock makes provision for 44 diesel-electric units, 2,840 wagons, 108 coaches, one self-propelled railcar and 129 service vehicles. Included in this appropriation is an amount of \$21,900,000 for 83 new stainless-steel coaches, part of an order for 173, 36 of them scenic-dome cars, placed with the Budd Company. The remainder of the order is to be delivered in 1955.

Burma Railways

THE report of the Burma Railways Board for 1951-52, which has been sent to us by the Chairman, Mr. E. Barnard, shows that up to September 30, 1951, the Board was governed by the Burma Railways Emergency Provision Act of 1943, but from October 1, 1951, the provision of the Union of Burma Railway Board Act applied. Under this Act there is a full-time permanent Chairman of the Board who is also the Chief Executive Officer. The Board consists of the General Manager, Secretary, Ministry of Transport & Communications, a representative of the Ministry of Finance & Revenue, three members representing the Burma Railways Workers Union, and four non-official members nominated by the government.

During the year under review there was a marked improvement in the internal situation of the country and through running was resumed between Rangoon and Mandalay after a gap of over three years. The total mileage under operation at the end of the year was 1,515. There were 454 cases of sabotage as against 542 in the previous year. The track was sabotaged 187 times, trains fired at 23 times, and buildings burnt down on 17 occasions. Bridges were blown up 176 times, 48 trains were mined, and three stationary engines were damaged by explosives.

Passengers killed numbered 32 and 71 were injured. The corresponding figures for railway staff were 15 and 33. At the time of the report the audited figures for the year were not available but the annual accounts for 1948-49 have been closed and those for 1949-50 are nearing completion.

Some of the principal provisional figures for 1951-52 are given below:—

	1950-51	1951-52
	(Millions)	
Passenger journeys	9.8	11.8
Passenger miles	206.3	252.0
Goods tonnage carried	1.4	1.7
	Kyats (Millions)	
Passenger revenue	9.5	11.5
Goods traffic revenue	19.0	25.7

The gross traffic earnings during the year amounted to kyats 497 lakhs, against the revised budget estimate of K.415 lakhs. The number of passengers increased by 21 per cent, as did passenger receipts. An increased number of trains, security, and intensive checking of trains combined to bring about this result. Goods traffic increased by 21 per cent and goods receipts by 32 per cent over 1950-51, and the average haul of goods traffic rose from 90 miles to 109. In terms of net ton-miles, the increase in goods traffic was nearly 46 per cent.

During the year the railways carried about 372,000 tons of export rice to the port of Rangoon out of a total of 841,000 tons exported. The tonnage of sugar and allied products shows an increase of from 445,123 tons in 1950-51 to 1,007,582 in 1951-52.

The necessary site data required for the new rail-road bridge across the Sittang River were forwarded to Messrs. Rendel, Palmer & Tritton, designers of the bridge. The introduction of oil-burning locomotives has been under consideration and the report states that arrangements were put in hand to purchase six diesel-electric locomotives for main-line use.

Railway Operating Economics

IN his recent paper on "Operating Economics in Practice on the Railways," read to the Railway Students' Association, Mr. A. R. Dunbar, Divisional Operating Superintendent (Eastern), British Railways, Eastern Region, said that the theme for his paper, and for the others in the present session, had been set by the President, Mr. David Blee; the theme was the link between education and practice in transport. At the present time there were virtually no organised courses in railway operating theory being undertaken at the universities and colleges which had them before the war. It was to be hoped that something of the sort could be attempted again and he urged the Association to press the need on both the railway and educational authorities.

There is a tendency nowadays, Mr. Dunbar considers, to belittle the theorist and the planner, and certainly a leavening of experience is needed, but the study of theory encourages the constant seeking for a reason, the application of commonsense to problems and the use of simple arithmetic as one of the tools of the trade. The problem of giving the student of transport a chance of applying a trained and critical mind to practical problems while he is still keen has yet to be solved.

In passenger train working the producer and consumer of transport come closest together and every detail of the service is open to the customer to see. There also the cost of providing the service is most strongly influenced by the consumer. The basic operating economics of passenger train working are well known, but there is always an opposite pull from the passenger, who is critical of detailed changes as they appear. The conclusion reached in recent years is that rather than patch up an old timetable it is better to wipe it out and start afresh. Traffic census figures are taken as a guide and an engine and stock kept running up and down the line on paper. Spare time is squeezed out where possible, regular patterns are introduced, and trains added to give the required quantity of service. In many timetables thus treated, Mr. Dunbar points out, better services have been given with fewer

engines and coaches and fewer staff. Finally there has been much improved net revenue. A recent review of this kind undertaken by the Western Region in the Cardiff Valleys shows that an entirely replanned service, giving more train miles, can be worked with 25 fewer engines, 98 less coaches, and a manpower saving as well. A revision of the services from Liverpool Street over the last four years, helped by the use of "Britannia" class Pacific engines, has saved 10 engines, 14 sets of trainmen, and 36 coaches; net revenue has been improved by £100,000 a year.

Branch line working should be investigated and some lines should be closed. Others can be given an injection of new life by diesels which give more production for men and machines, but he does not think the diesel likely to save the branch line which is not reasonably patronised under steam. Where, on main lines, traffic is of the order of 3,000,000-4,000,000 trailing ton-miles a year for a mile of single track, there is a *prima facie* case for electrification.

On the problem of peak traffic, Mr. Dunbar doubts whether the waste of transport involved has yet been tackled with sufficient vigour. Some Liverpool Street electric trains make only one really effective journey in the peak, but may cost £100,000 to build and £10,000 a year to keep going. For the holiday peak corridor stock exists which is needed on only four or five Saturdays in the year; such a coach costs about £750 a year to provide and maintain, without running and cleaning costs. Propaganda, and particularly price persuasion, should be used to convince the public that the peak problem is costly. Meanwhile the railways will strive to make the best of it by precise measurement and exact planning of the use of the equipment to give maximum productivity.

There are over 1,000,000 wagons on British Railways, representing a capital value of nearly £300,000,000. Nine per cent of the stock out of service for repairs means some £27,000,000 lying idle. The average wagon mileage is no more than 85 a week. The 480 types of wagon at the time of nationalisation have been reduced to 90. The 24½-ton wagon has been introduced but cannot be used universally until colliery screens and so on are equipped to deal with it. The provision of continuous brakes on all wagon stock, he states, is the ideal. Wagons should be designed to run at a high common speed with the most useful pay load and capacity loading should be urged. Fewer marshalling yards will save both wagon time and wagons, but the yards must be well designed and located.

U.S.A. Railway Wagon Hire Settlement

THE basis of payment for the interchangeable use of wagons was an early problem for the U.S.A. railways and is still a live issue. At first individual railways fixed mileage rates with each other, but these arrangements were unsatisfactory because they did not provide any incentive for the prompt return of foreign wagons and the accounts rendered by foreign companies could not be checked. Obviously a flat daily rate was free from these weaknesses and in July, 1902, a formal and universal code of "per diem" rules was adopted through the agency of the American Railway Association.

The first rule of the code enacted that the rate for the use of a wagon was 20 cents for every calendar day and was to be known as the "per diem rate." The rate was raised to 25 cents in 1906 and to 50 cents in 1907 to meet difficulties caused by an acute wagon shortage. A surplus of wagons developed in 1908 and the rate was put back to 25 cents.

About the same time the American Railway Association set up a commission under the chairmanship of Mr. James McCrea, President, Pennsylvania Railroad, to study the "per diem" question in all its bearings and determine the rate of payment per day. The commission decided that five elements should be taken into account in calculating wagon expenses: cost of repairs; cost of replacements (depreciation and retirements); cost of taxes; interest on cost; and other allowances incident to ownership. These five

elements have formed the basis of every subsequent reckoning of wagon expenses in so far as they influence the per diem rate. There the immediate success of the commission ended. Most of its members recommended a rate of 40 cents a day, but not until 1913 was a per diem rate of 45 cents adopted after seasonal rates of 30 cents for March to July and 35 cents for August to February had been found insufficient to compensate many companies for owning and maintaining wagons.

During the first world war more adjustments were made and at the end of Federal control of the railways the per diem rate stood at 60 cents. In March, 1920, the American Railway Association put a rate of 90 cents into effect, but eight months later advanced the charge to one dollar because of the sharp rise in labour and material prices. This convenient rate remained in force until February, 1945, when the effects on the national economy of the second world war and its aftermath started a series of 25 per cent increases which doubled the per diem rate by March, 1952. The Association of American Railroads arranged these increases after more than one enquiry by its Operating-Transportation Division, assisted by Dr. J. H. Parmelee who was then Director, Bureau of Railway Economics, into the significance of various items of cost, not previously developed in detail.

A fresh cost study of the per diem rate was conducted between October, 1952, and April, 1953, in the light of information supplied by 121 railways owning 1,782,000 wagons at the end of 1952. The investigating committee substituted an annual depreciation allowance for wagons and repair facilities on the basis of reproduction value for an allowance on the basis of ledger value, which was used in all previous enquiries. This change in method justified

a daily rate of \$2.40, which became effective on August 1, 1953. Thereupon three New England companies, the Boston & Maine, the New Haven, and the Rutland, served notice declining to pay more than \$2 a day. In a representative year these railways owned 14,300 wagons, but on an average had twice that number on their lines so that the wagon hire accounts against them are substantial in amount. Accordingly, in September the Association of American Railroads asked the Interstate Commerce Commission to declare the rate of \$2.40 reasonable and lawful and to find that uniform observance by all railways is required in the interest of orderly rail service.

At the hearing of the case in January, Dr. Parmelee, in his capacity of Economic Consultant for the A.A.R., submitted a statement explaining in detail the steps taken to fix the various per diem rates in force from time to time. Cost calculations and related data accompanied his statement, which bristled with technicalities. Fortunately Counsel for the railways requested Dr. Parmelee to prepare for the record a "Brief History of Freight Car-Hire Settlements" and this article is based on that clear and candid document. The I.C.C. may take some time to come to a decision on the voluminous evidence before it. The complicated proceedings at Washington D.C. make us admire the skill and patience with which the old British railway companies handled corresponding questions about common user of wagons and journey payment schemes. The scope of arrangements in this country was limited in size compared with the American problem of controlling wagon distribution on 225,000 miles of road, but the change from the long-established Railway Clearing House regulations for wagon mileage and demurrage was made without causing much friction among the member companies.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Anglo-Continental Traffic

March 23

SIR.—The paper read by Mr. R. E. Sinfield and commented on in your February 26 issue, drew attention to the increasing proportion of traffic now carried by air at the expense of railway and steamer services, in particular in higher class traffic. I suggest that the reason why those prepared to pay the higher fares are increasingly deserting surface travel is that, except for the "Night Ferry" and the Harwich/Hook night service, the cross-Channel services have undergone little change for many years, and no longer fulfil the expectations of regular travellers making more than perhaps just one journey a year.

The aim must be to provide the highest degree of freedom from change of train, transfer from one terminal to another, and other interruptions to the journey of the avoidance of which the airlines make such propaganda. Travellers now see an alternative to the "bother" of surface travel to the Continent, and if British Railways ignore this attitude, their losses of upper class passengers will go on increasing.

The "Night Ferry" has succeeded because it saves valuable working hours, has the attraction of comparative novelty, and for the sleeping car passenger the avoidance of disturbance. The Harwich/Hook service appeals because of the very high standard of service provided, and its very convenient timing.

Additional traffic for the "Night Ferry" could be created by extending it to include Brussels, to which there is now no adequate night service, that via The Hook reaching Brussels too late in the morning, and necessitating change at Rotterdam.

Train services connecting with the Dover/Calais steamers should be more fully integrated with the internal services, so that London ceases to be the terminal point of boat trains. The airways timetables show that increasing attention is being given to direct transit between cities in central and northern England and Scotland, and the Continent.

The railways could recover some of this traffic if they were to operate to Dover from Liverpool, Manchester, and the West Riding sleeping cars and through carriages connecting with morning sailings to Calais and Ostend. The current timetable shows this could be achieved with relatively little extra mileage.

A secondary result of such services would be to bring the north into direct communication with south-eastern England, for the through vehicles should not be confined to cross-Channel passengers. Stops could be made at Ashford and Folkestone and London passengers could use Willesden Junction or Kensington Addison Road.

Generally the plan would follow existing practice on the Continent where the trains connecting with the ships at packet ports are not all operated exclusively in connection with the sailings, and the working of the through train round London would correspond to the Paris Ceinture. The effect of such services, to which through sleeping cars and coaches to and from Edinburgh and Glasgow might well be added, would be far-reaching on those who, particularly in the winter months, prefer the greater reliability of surface travel, and, properly advertised, would help to convince public opinion that British Railways are really alive to the changed needs of passengers who now have a much greater choice of a means of travel. Such an innovation could be undertaken without undue expense, and is accordingly well worth trying.

Yours faithfully,

MONTCLER

[The main obstacle to a Brussels branch of the "Night Ferry" is the absence of suitable trains between Dunkirk and Brussels in which to work the through vehicles; the number of the latter, limited by the capacity of the ferry-boats, would not justify special workings to and from Brussels. The demand for through services between packet ports and the Midlands and North of England does not warrant facilities to which our correspondent refers.—*Ed., R.G.*]

THE SCRAP HEAP

Official Jargon

The title of an original contract drawing of a railway underbridge built in 1896 is: "G.N.R. Extension of Leem Valley Railway. 'Disturnpiked' Main Road Bridge (Skegby)."—*From a letter to "The Times."*

Private Enterprise Venture

When construction of a light railway to the summit of Ben Nevis was suggested at a meeting of the Lochaber District Council, Inverness-shire, a councillor said that a railway to the top of Britain's highest mountain would provide an enormous stimulus to the tourist trade in Scotland.

"If Ben Nevis happened to be situated in the neighbourhood of London," he added, "there would have been a railway to the top of it ages ago." An engineer had told him that the topographical features of Ben Nevis lent themselves to the construction of a railway.

While agreeing that such a railway would attract tourists, the council thought that the matter was one for private enterprise.—*From "The Manchester Guardian."*

A Railway Family Record

A total of over 600 years of railway service is claimed by the Booker and Bevan families. It begins in 1840, three years after the opening of the London & Birmingham and Grand Junction Railways, when James Bevan entered railway service at Crewe. Grandfather had five sons, all of whom joined the L.N.W.R., and a daughter who married Herbert Booker, a Crewe goods guard, who retired in 1920. He was the father of John Booker, a restaurant car conductor, and another son, Arnold.

John Booker first worked in the Crewe Station refreshment rooms and Arnold in the Crewe Goods Department as a clerk. Arnold Booker has now retired, and his son Clifford is in the District Traffic Superintendent's office at Chester.

John was married recently to Miss Doris Bourne who has worked in the refreshment rooms at Crewe, Nuneaton, and Rugby and is at present the manageress in the refreshment rooms at Dover.

Royal Underground

"From Brussels I hear that work is shortly to begin on the tunnels which are to take the central tramways underground. Contrary to what most people believe, this will not be the city's first Underground. King Leopold II, a great admirer of all things Parisian, wanted a Metro. That Brussels should be without one grieved Belgium's greatest king. Finding he lacked the support of both his statesmen and his engineers, Leopold began building an underground of his own. His aim was to link the residence Palace of Laeken with the Palace of Brussels and Schaerbeek Station.

Though the scheme was never finished, a mile or so of marble-lined tunnel still remains beneath the Laeken grounds."—*Peterborough in "The Daily Telegraph."*

[Brussels also has an underground railway of another type, the recently-completed Junction Railway which traverses the city, partly in cutting and partly in covered way, linking the main lines running out of the capital to the north and south—Ed., R.G.]

Stamps to Commemorate Railway Centenary

To mark the centenary of the inauguration of the first Norwegian railway, three commemorative stamps are being issued. The railway was built primarily to carry timber from Eidsvoll to Oslo for shipment abroad. The 20 öre stamp will show the first Norwegian railway engine and, in contrast, a horse dragging a load of timber; the 30 öre stamp will show a diesel express train on the Oslo-Bergen line; the 55 öre stamp will show a driver in his cab. Reference to the question of issue of special postage stamps to commemorate the forthcoming International Railway Congress in London was made in our issue of February 26.

Waiting a Pleasure

Letters by two satisfied passengers to *British Railways Magazine, Eastern Region*, express satisfaction at good service. One writer, having missed his con-

Advertising British Railways



EXPRESS FREIGHT
 DAY AND NIGHT THE WHOLE YEAR ROUND 425
 EXPRESS FREIGHT TRAINS LINK TOGETHER THE
 PRINCIPAL INDUSTRIAL CENTRES OF THIS COUNTRY
 Backbone of the Nation's Transport

One of a series of colour posters produced by the Department of the Chief Public Relations & Publicity Officer, British Transport Commission

nection at Doncaster, and with the prospect of a 2½-hr. wait, went with 10-12 other irate passengers to see the stationmaster, who not only made them feel at home in his office, provided a chair for everyone, laid on a special train, but was the essence of courtesy. Discussing the situation on the way to Hull, one other passenger summed up the situation very aptly by saying, "He almost made it a pleasure to have missed the connection."

Another passenger, who had occasion to wait at Belton & Burgh Station for about half-an-hour recently, feels that he must express his "appreciation" to whoever is responsible for such a beautifully clean and comfortable waiting-room.

Everything, he states, was bright and shining, and it was a treat to see plants on the window sills and, to add to all this, a good fire. He adds that it is not surprising to see so many diplomas on the walls for a well-kept station.

Plus ça Change . . .

Here, in safe harbourage from the sudden squalls

That so beset the busy tides of men,
 I take my ease and savour with delight
 Each brave new word that swims into
 my ken.

These strange, exotic words, from the
 unsullied spring
 Of *papier-mâché* English, have their
 day,
 Then fold their tents and silently depart
 When some new specimen gets under
 weigh.

I love these potent polysyllables
 That vie with Einstein's "Relativity"
 In mellifluous tripping from the tongue;
 Take B.R.'s latest—"Productivity."

What it all means, of course, is just
 about
 As clear as mud to me, but I am told
 That hordes of grim, horn-rimmed in-
 quisitors
 Descend, Assyrian-like, upon the fold.

I have seen many such; they come and
 go,
 Making things inconvenient for a spell,
 Produce statistics by the measured mile
 And pass the buck on reasonably well.

Not once nor twice, in my extensive
 span,
 Have I been moved to quote: "What's
 in a name?"
 For, human nature being what it is,
 Most changes pass and leave things
 much the same.

From Porter Bill, who seldom minces
 words
 And for officialese has little love,
 I get the rank-and-filer's point of view:
 "The bloomin' Razor Gang's in session,
 Guv'!"

A. B.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

C.N.R. Automatic Signalling

Automatic signals are about to be introduced by the Canadian National Railways on the 141 miles between Port Arthur and Atikokan. Centralised traffic control has been installed on the 105-mile single track between Atikokan and Conmee. Automatic block signals are being installed on 35 miles of double track between Conmee and Port Arthur.

Introduction of the new signals will complete a programme begun by the C.N.R. in 1952. The traffic capacity of the line will be increased two-and-a-half times. During the peak 180-day season it will be possible to carry upwards of 15,000,000 tons of iron ore, as well as grain and other regular traffic over it.

ARGENTINA

New Services

The General Mitre Railway has placed into service a new one-class day express, "El Popular," between Buenos Aires, Córdoba and Alta Gracia, with both rail and road connections in Córdoba for the hill stations. The new train, which runs

on four days a week, is composed of new stock manufactured by Werkspoor.

The General San Martín Railway has introduced a new weekly night express, named "El Condor," between Buenos Aires and Mendoza. This train is also composed of Werkspoor stock with an air-conditioned Pullman coach and a bar coach. If the traffic warrants, this train will run twice weekly. The General Belgrano Railway has inaugurated a service of one-class trains on Saturdays, Sundays, and Mondays between Santa Fe and Guadalupe, a popular resort.

UNITED STATES

Organisation for Better Rail Service

A separate passenger service department has been set up by the Boston & Maine Railroad, to conduct an intensive review of the railway's passenger operation, on which the annual deficit since the war has been some \$12,000,000. The department, headed by Mr. Robert M. Edgar, a Vice-President of the B. & M., has complete authority to set up an organisation to handle all passenger operation, traffic, and sales. The Pennsylvania Railroad has appointed a terminal committee to work out procedure

for speeding up freight movement through marshalling yards and terminals. Lastly, the New York Central System has created an industrial engineering office, designed to extend mass production techniques to the movement of traffic in bulk.

Pennsylvania Ignitron Locomotive Test

On a recent test run, the twin-unit Ignitron electric locomotive built by Westinghouse for the Pennsylvania Railroad successfully hauled a train of 161 bogie coal wagons, loaded, over a distance of 131 miles at an average speed of 32 m.p.h. This performance worked out at 434,980 gross ton-miles (388,375 ton-miles in long tons) per train hr.—a remarkable figure for a B-B-B+B-B-B locomotive assembly worked by a single crew. On these electric units the line voltage of 11,000 a.c. is converted to d.c. for the traction motors by Ignitron tubes instead of the usual transformers.

More Diesel Locomotive Orders

Recent diesel orders placed, additional to the single Union Pacific order for 205 units, are 79 units for the Southern Pacific Railroad, valued at about \$16,000,000. Of these 16 will be 2,400-h.p. passenger units, 57 1,750 h.p. freight or combined freight and shunting units, and six 1,200 h.p. shunters. Delivery is expected to be completed by July.

The Chicago, Milwaukee, St. Paul & Pacific has ordered 65 units, estimated to cost \$9,574,300. They will comprise 35 combined freight and shunting units of 1,600 and 1,750 h.p., six freight units of 1,750 h.p., and 24 shunters of 1,000 and 1,200 h.p.

AUSTRIA

Double-Deck Motorcar Wagons

The Federal Railways plan to construct 10 double-deck bogie wagons for the transport of motorcars. They will be used mainly for the existing traffic between the Fiat establishments in Turin and Styria. The design will take into account the experience already gained in France and Germany with similar wagons, and use will be made of available bogie chassis.

DENMARK

New Diesel Locomotives

On February 23 the first of the four 1,500-h.p. Nohab-General Motors diesel locomotives for the State Railways was shown to railwaymen and the Press at Copenhagen Central station. Representatives of the railway and of the builders, Nydquist & Holm A.B., Sweden, later gave interviews and explanations. The locomotives are of the AIA-AIA type, of 106 tons total weight and with 72 tons of adhesion. It is proposed to use them first on the Nyborg-Aarhus and Nyborg-Padborg routes.

New East African Railways Wagons



One of the new wagons of the East African Railways referred to in our April 2 issue being inspected at Nairobi by (left to right) Messrs. C. T. Hutson, Chief Commercial Superintendent; J. A. Addington, Assistant Chief Operating Superintendent; A. F. Kirby, General Manager; and G. Gibson, Chief Mechanical Engineer, East African Railways & Harbours

International Railway Congress, London, 1954

Programme of business meetings, official functions, and technical visits and inspections

THE formal opening of the 16th International Railway Congress, the first congress in this series to be held in London since 1925, will be performed in the Assembly Hall of Church House, Westminster, at 10.30 a.m. on May 19, by H.R.H. the Duke of Gloucester, Honorary President of the Congress. Also present will be Mr. Alan Lennox-Boyd, Minister of Transport and Civil Aviation; Monsieur M. de Vos, President of the International Railway Congress Association and General Manager of the Belgian National Railways; Sir Brian Robertson, Chairman, Sir John Benstead, Deputy Chairman, and other Members of the British Transport Commission; Sir John Elliot, Chairman of the London Transport Executive; and civic representatives. In the evening, H.M. Government will give a reception to the delegates.

The plenary sessions, also in the Church House Assembly Hall, will be held at 11 a.m. on May 25 and at 3 p.m. on May 26, the latter being followed at 4 p.m. by the formal closing of the Congress by Mr. Lennox-Boyd. The official dinner of the Congress will be held at Grosvenor House, London, on May 25.

Over 450 delegates from more than 30 different countries will attend the Congress. Reference to the part played by the British Transport Commission, British Railways, and London Transport, in the organisation and management of the Congress was made in our issue of March 26.

Meetings of the Sections

The five sections will hold their special business meetings on May 20, 21, 24, 25 and 26, also at Church House. For the 16th Congress, however, only 11 questions are on the agenda, two each for discussion by Sections I (Way & Works), II (Locomotives & Rolling Stock), III (Railway Working), and V (Light Railways & Colonial Railways), and three questions by Section IV (General).

On each of these questions two, or in certain cases, three reporters, who are senior officers of member railway administrations, collate the answers to the questions received from a number of railways; the latter are grouped as considered convenient for the question under consideration, such as the group of railways in English-speaking countries, or with British associations, or where British railway practices largely prevail, whose replies to Question 4, listed below, on steam locomotives, were summarised by Mr. C. T. Long, of the South African Railways. In two cases two reporters have submitted a joint report on the replies of one group of railways.

The reports are being summarised in *The Railway Gazette*; in the following list, the date (in 1954) of the issue in which a summary already has appeared is given in brackets after the name of the reporter.

Questions for Discussion

Section 1

(1) What are the present tendencies relating to the organisation of permanent way maintenance; methods of determination of work to be done, and in particular, possibilities of the use of detecting-recording coaches; planning of works, effects of mechanisation; and so on? Economic and financial aspect.

Reporters: M. Feyrabend, Maintenance Engineer, South-Eastern Region, French National Railways (February 5); Dr. Schramm, Chief Officer, Central Administration, German Federal Railways; and Mr. O. Hjelte Claussen, Senior Engineer (Permanent Way), Danish State Railways (January 22).

(2) Modernisation of station buildings and methods employed in financing modernisation projects. Standardisation of unit construction applied to railway building.

Reporters: M. Jose Chedas Bogarim, Chief Engineer (Rolling Stock), Portuguese Ministry of Transport (March 5); and Dr. F. F. C. Curtis, Architect, British Railways (British Transport Commission) (January 29).

Section 2

(3) Technical and economic investigation of the basic characteristics of electric traction systems now in use, with a view to deciding whether, and to what extent, there are relevant reasons for preferring one system to another. In particular, are there any reasons in regard to (a) power supply, (b) overhead line and fixed track installations, (c) motive power units, (d) working and maintenance costs?

Reporters: Dr. C. Guzzanti, Italian Ministry of Transport; and Mr. S. B. Warder, Chief Officer (Electrical Engineering), British Railways (British Transport Commission) (February 19).

(4) Means and methods to improve the efficiency of steam locomotives: (a) increase of steam pressure; (b) types of grates; (c) superheating; (d) pre-heating and treatment of feed water, etc.

Reporters: M. Manlio Diegoli, Officer (Rolling Stock & Motive Power), Italian State Railways; and Mr. C. T. Long, Assistant Chief Mechanical Engineer (Motive Power), South African Railways (February 12).

Section 3

(5) Radiophonic communications in railway working.

Reporters: Mr. J. Frischauf, Chief

Officer (Telecommunications), Austrian Federal Railways; and Messrs. S. G. Hearn, Operating Superintendent, London Midland Region, British Railways, and J. H. Fraser, Chief Officer Engineering (Signal & Telecommunications), British Railways (British Transport Commission) (joint report).

(6) Remote operating of signal boxes. Electrical working and control devices for hinged and flexible points and switches.

Reporters: M. J. Nogues, Deputy Manager, Spanish National Railways; Mr. H. Grünwald, Chief Officer, Central Technical Office, German Federal Railways; and Mr. Sorvik, Resident Engineer, Electrical Dept., Norwegian State Railways (February 26).

Section 4

(7) Modernisation of methods of staff recruitment.

Reporters: Dr. Huyberegts, Assistant General Manager, and M. Berghmans, Chief Officer, Belgian National Railways (April 2) (joint report); and Mr. F. Lemass, General Manager, Coras Iompair Eireann (March 12).

(8) Determination of principles of geographical and functional organisation of a railway system. Simplification and retrenchment of the administration of railways.

Reporters: M. Dugas, Director of Planning, French National Railways; and Mr. Bengt Adamson, Operating Department, Swedish State Railways (March 26).

(9) Railway participation in road transport undertakings.

Reporters: Dr. G. Dreyer, Assistant Secretary General, Swiss Federal Railways; and Mr. Tissot van Patot, Chief Officer, Central Headquarters, Netherlands Railways, Utrecht (April 2).

Section 5

(10) Wear of rails on curves: (a) running effects of locomotives and motor coaches with motor bogies; (b) characteristics of tracklaying on curves and details of rolling-stock liable to cause premature wear of rails; (c) results of the investigations made, and proposed remedies. Use of rail-lubrication processes.

Reporters: M. Ripert, Chief Officer (Permanent Way), Economic Railways of France; and Mr. Venkataramayya, Chief Structural & Permanent Way Designer, Central Standards Office, Indian Railways (March 5).

(11) Protection of overhead lines, sub-stations, locomotives and motor coaches against accidents of electric nature (excess voltage, overloads, short-circuits, lighting).

Reporters: M. De Boeck, Chief Engineer (Rolling Stock & Motive

Power), Belgian Light Railways (March 19); and Mr. T. S. Pick, Chief Electrical Engineer, London Transport Executive.

Technical Visits and Inspections

Arrangements have been made for delegates to visit, after the morning sessions of the Congress, important railway and harbour installations, as under:—

May 19. Willesden Carriage Cleaning & Servicing Depot, London Midland Region, British Railways.

Electrical control rooms and sub-

stations, 50-cycle conversion scheme, Southern Region, British Railways.

May 20. Swindon Works, Western Region, British Railways.

London Transport Civil Engineering Depot, Lillie Bridge.

May 21. Southampton Docks, British Transport Commission.

Liverpool Street—Shenfield electrification, Eastern Region, British Railways, and Central Line tube extension, London Transport.

May 24. British Railways Locomotive Testing Station, Rugby, London Midland Region.

Railway protection works against sea erosion, Folkestone Warren, Southern Region, British Railways.

London Transport Railway Rolling Stock Overhaul Works, Acton.

May 25. British Railways/London Transport Exhibition of the latest locomotives, rolling stock, civil engineering and signalling equipment, Willesden Motive Power Depot (open to general public, May 26—29).

May 26. British Railways Exhibition "Collection & Delivery—Past and Present", Marylebone Station (open to delegates only).

Sixteenth International Railway Congress

Remote Control of Points and Signals: Design of Electric Point Mechanism

Economic and other aspects of centralised and other forms of remote control: electric point mechanisms: trailability

ON Question 6 to be discussed at the International Railway Congress in May the replies of railways in the "English-speaking" group of railways, or those with British associations, were discussed in our issue of February 26. The reporter for Austria, Bulgaria, Czechoslovakia, Germany, Hungary, Yugoslavia, Poland, and Roumania was Professor A. Dobmaier, formerly Signal Engineer, Germany Federal Railway, now Head of the Engineering Department. His questionnaire was prepared in collaboration with his management, but Austria alone replied to it. Probably the other countries have no, or only very small, remote control installations.

Germany has remote control at certain stations and over complete lengths of line, but Austria has only a few isolated examples at stations. Over a length of line new operating methods are called for, but in a station area only the problem is purely technical and involves no change in traffic working, the rules for which are practically the same in Germany and Austria. In the latter the chief reason for installing remote control was to save staff and reduce cable costs in power signalling, but in Germany the aim was wider.

It was desired in most cases to increase track capacity and on double lines by using suitably located crossovers, to allow one train to overtake another by transferring it to the wrong line. As yet C.T.C. has been applied there only to double track, but that is purely accidental. It is preferred for heavy traffic lines having a large number of small stations and few large ones. The number of trains and tracks is of secondary importance in considering whether a station should be controlled remotely or not.

A large installation is that between Regensburg and Nuremberg, 52 miles, with 150 trains daily in each direction.

There is also the 7½-mile section between Bebra and Cornberg, where one line is arranged for reversible working. The first mentioned work comprises 74 remote controlled points and 90 signals, but there is no reversible feature.

Remote control interlocking for stations with several passing sidings is not yet available in these countries, but Germany contemplates sub-dividing a station area into several zones so controlled, with a similar means of operating junctions at a distance from stations.

In Austria relay block apparatus is used and there is no automatic signalling. Germany has track worked automatic signals, with "controlled" ones connected to the C.T.C. machine and fitted with "reduce speed" and "run more quickly" signs to instruct drivers to regulate their movement to meet traffic requirements. All points in the C.T.C. area are electrically controlled and repeated, but details of equipment vary.

The Austrian system permits of connecting some 5 local layouts with 6-8 sets of field apparatus, but the German allows of any number. Where this is very large it is recommended to have the control machine half way along the route. It is not contemplated in Germany to exceed from 60-75 miles under the one control machine, although greater lengths could be arranged for. Both relay chains and rotary selectors are used in these countries and in Germany polarised impulses are adopted. Both countries agree that the most suitable course is to effect the interlocking of points and signals at the outlying locations.

Route Setting

Route setting is applied in Germany; for shunting movements the points are not controlled from the central machine, but in all cases from a local panel electrically released therefrom. In some

cases both normal and reverse positions of the points are repeated to the machine, in others only the fact that the points are properly closed. Any trailing through is automatically indicated. Austria uses both cables and line wires, but Germany as yet cables only for remote control, although tests with open line wires have been begun there.

Experiments in Austria have shown that on an a.c. electric line special measures are necessary in connection with d.c. transmission to protect against induced currents only if underground cables are used, but the method adopted has not been reported. The number of channels required depends in each case on the number of locations and the peak traffic on the line. The transmission system used in Austria is slower working than the German, but both use storage of impulses which in Germany are re-transmitted automatically at the correct moment. In Austria this has to be done manually. Both countries use the telephone type relay, polarised when required. Local power supplies are used with batteries in some cases. In Germany 3-phase current is used for point machines.

Auxiliary emergency power supplies are always provided. There are no electrical point heaters in either country but tests with them and propane gas burners are in progress.

In Germany requirements regarding failure indication are very strict and call for notification of interruption of the transmission line, failure of points or of signal lamps and relays at the locations.

Failure of any one location does not affect others, but if the transmission line becomes interrupted it must affect all locations beyond the failure. Germany considers it essential that if failure occurs traffic must continue with the minimum of difficulty. Every loca-

tion has its own control panel from which everything can be conducted if the line circuits fail, just like a local signalbox, but in Austria hand operation must be resorted to.

The German system offers the greater advantages. The dispatcher, on interruption of the transmission line, gets in touch with the local staff, by public telephone if necessary, and orders their equipment to be brought into use. The German installations have automatic traffic graph recorders. The train numbers, from the working timetable, also are shown by indicators on the control panel and these move from section to section as the train itself progresses. They are shown also at certain intermediate locations on the panels used there on special occasions.

Very complete telephonic communication is always provided throughout a remotely controlled line or area. The Regensburg-Nuremberg installation has been divided into four maintenance districts, with motor vehicles available for use by the staff. No experience has as yet been obtained of the use of maintenance staff to carry out reconditioning of the apparatus. There are special operating rules for this installation.

Electric Point Operation

As regards electric point operation there is a general similarity of practice ruling in Germany and Austria in the sense that all points are made trailable and are fitted with means of locking the closed tongue to the stock rail, either by the toggle, hook or clamp type lock. (The toggle mechanism has not been applied for some time in new work.)

Detectors are fitted in connection with running signals. If these are mechanical they of course form an additional lock on the points when the signal is at clear. For electrical detection various methods are used. In its most complete form this proves both tongues properly in position and the closed one locked. An additional electrical bolt also is provided in certain instances and when operated renders trailing without damage impossible.

With long flexible type point tongues for turnouts taken at high speeds two sets of mechanical clamp locking are provided to ensure absolutely that the tongues operate perfectly. With these complete appliances there is no speed reduction over facing points.

The general design of the point machines is much the same in both countries, but operating and retaining forces differ, according to the type of points to which they have to be applied. The retaining force is about 550-730 lb. but is higher in the case of marshalling yard points. Operating times vary from 5 or 6 seconds to as little as 0.8 sec. for yard points where the hook or clamp locking is dispensed with.

In Germany the operating current is independent of the traction system and d.c., single-phase a.c. and three-phase

a.c. supplies are used, the latter only in connection with all relay type interlocking installations. In Austria, on steam lines d.c. is used for point operation and a.c. on electrified lines, either at 50 cycles, taken from the public supply, or at 16½ cycles, when the traction supply is drawn on. For indication purposes d.c. is used.

The most usual arrangement is for the control current to be interrupted at the machine itself directly the stroke is complete and the detection or indication current then to become applied automatically to the circuit. All point machine motors are reversible and capable of running in either direction.

Various forms of gearing, worm, spur, and so on are used by different makers. Remotely controlled machines do not differ from those operated by direct circuits from the signalbox, and both in Germany and Austria remotely controlled points very generally have means of local electric operation under release from the signalbox or C.T.C. apparatus. Hand cranking in emergency is also available. While points are being worked locally, no route involving them can be set up from the signalbox.

Special disconnecting arrangements are used to enable maintenance work to be carried out on point machines without risk to the staff and traffic.

The average number of hours annually spent on maintenance of all point machines is given as 16 for Germany.

Trailability

Although trailability is a feature of all electric point mechanisms in both Germany and Austria, any deliberate running through of points from the wrong direction is prohibited and should only occur through inadvertence on the part of drivers or shunters. For that reason no question of a speed limit arises. Maximum speed when shunting is limited to 15 m.p.h. and it is only such movements that in the ordinary course would occasion a run through.

These trailable points are all operated on the one principle, that the wheels of a trailing vehicle act first on the open tongue and by moving it withdraw the lock on the closed one in time for it to move without damage to the equipment. The points remain in the position to which they are moved and do not return, as in the case of spring control, to their original position. This prevents a shunt movement which sets back resulting in a split train. When electrically operated points are trailed, an alarm rings in the signalbox and the fuse in the point circuit is blown. The points must be brought back into agreement with the controlling lever or other device and a fuse be again inserted before any signal reading over them can be given.

Indication of Trailed Points

In an all-relay signalbox the tracks on the control panel become lighted in red, showing where the trailed point is and from which direction it has been forced over. Generally specifications are more complete and stricter in Germany than

in Austria, as regards the details of these matters, which necessitates the point machines being of rather more elaborate design. The latest type of three-phase machine in particular is a consequence of this. All machines are adaptable to any location, and can be fixed on either side of the track, as required.

NEW ROOF FOR WALSALL MOTIVE POWER DEPOT.—Work is making good progress on the provision of a new roof for the Walsall motive power depot of British Railways, London Midland Region. At the same time electric lighting will be installed instead of gas in the yard and shed, and repairs will be carried out to the engine pits.

ELECTROMAGNETS LIMITED EXHIBITS AT THE B.I.F.—A comprehensive range of swarf separators and permanent magnet equipment will be exhibited at the forthcoming British Industries Fair at Castle Bromwich by Electromagnets Limited. The exhibits will include a permanent magnetic floor sweeper of the discharging type which has a ground clearance of 2 in. A lifting magnet control system known as the Select-O-Load will be exhibited, the system of which is said to be ideally suited for cupola charging, in that it gives extremely fine control of the amount of iron it is desired to lift or discharge. A 42-in. dia. lifting magnet complete with controller and generating set will be demonstrated.

GOOD PROSPECTS FOR TOURIST TRAFFIC IN BRITAIN.—Figures issued by the British Travel & Holidays Association show that the British tourist industry has started well in 1954. More than 56,000 overseas visitors arrived during January and February, an increase of 7 per cent over the corresponding period last year. U.S.A. traffic was 8 per cent higher than in January and February, 1953. Traffic from all the European countries, except France, showed an increase over last year's figures. Announcing these first statistics of the year, Sir Alexander Maxwell, Chairman of the Association, states that the results for January and February are very encouraging, and confirm his view that 1954 will be a record tourist year for Britain. He forecasts about 850,000 visitors and that tourist earnings will amount to about £130,000,000 this year.

NEW LONDON TRANSPORT BUS CONTROL METHODS.—New control methods have been introduced by London Transport to improve the regular running of buses in Central London. Buses have hitherto been regulated on the road by an inspecting staff on a localised basis, reinforced by a small mobile checking squad. While this control will be continued, on the local basis, a new Bus Running Control has been formed, with headquarters at Oxford Circus and a staff totalling 78 under two Chief Road Inspectors. Its members are out daily, in groups, to deal with services affected by traffic congestion, road repairs or other causes; they check timings, turn buses if required and generally take action to eliminate gaps or bunching. Special timing-points have been set up on the fringe of the Inner London area and every effort is made at these points to ensure that buses enter the area at correct intervals. Wide use is therefore being made of the London Transport private telephone network.

The Yonge Street Subway, Toronto

Rolling stock and signalling equipment of British manufacture; layout to cater for the movement of 40,000 passengers an hour in each direction

THE Yonge Street Subway of the Toronto Transit Commission, which, as was announced in our last week's issue, was opened on March 30, is some 4½ miles long and closely follows the line of Yonge Street, the main north-south thoroughfare of the city, for almost the whole of that distance.

The construction of a system of subways for Toronto was discussed as early as 1910 and was revived several times subsequently. The present scheme dates from 1942 when the Commission (then the Toronto Transportation Commission) submitted to the Mayor and the Board of Control a proposal for a north-south and an east-west subway as a means of relieving street congestion which, among other things, was seriously affecting the schedules of the Commission's tram and bus services. In a joint report submitted by Mr. Norman Wilson, a trans-

Eglinton Avenue was to be laid on another section of right-of-way on the west side of Yonge Street. The section in the centre of the city was to be built beneath the street in cut-and-cover and that on right-of-way in an open cutting. Sites for the intermediate stations were to be at King Street, Queen Street, Dundas Street, College Street, Wellesley Street, Bloor Street, Rosedale, Summerhill, St. Clair and Davisville.

At the same time, an east-west subway, initially to be operated by trams, was also recommended, to run from Trinity Park in the west to a point just east of the Don River in the east, beneath or close to Queen Street for the whole of its length of 4½ miles.

Decision to Use Railway-Type Stock

Originally, proposals for underground operation in Toronto had always envisaged using tramcars with, possibly, underground railway rolling stock as a

the easier grading possible, and the better arrangements which would result in the transfer of passengers to and from surface transport. The last consideration is important as more than half the subway passengers will transfer. The whole line has easy curves except for a 400 ft. curve from Front Street to Yonge Street. The maximum gradient is 1 in 29. Some 3.2 miles are in subway and 1.36 in cutting. Like that of the tramways the gauge is 4 ft. 10½ in.

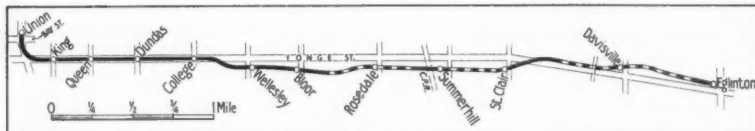
Structure of the Subway

In station sections the subway is a rigid frame reinforced concrete structure with its 54 ft. width supported in the centre on wide flange steel columns and a longitudinal structural steel beam. Between stations sections are entirely in reinforced concrete with the 32 ft. width supported between the tracks by a reinforced concrete wall. Portable steel forms were used for walls and roof in both sections and plywood forms in control areas, passages and entrances.

As construction was completed in each traffic diversion section, a progressive programme of restoring the street and public utilities was carried out. Before the beginning of construction in September, 1949, all work necessary to complete the subway was scheduled and contracts awarded. Work on each contract began within two weeks of the scheduled starting date except contracts for station finishing, which were delayed slightly because of revisions to contract plans. Nevertheless the completion date was extended only 90 days beyond the original schedule.

In designing the subway, structures were arranged to provide clearance for a composite type of underground car incorporating the largest dimensions of types operated in North America on similar services. Soil conditions favoured cut-and-cover construction at high level but operating requirements finally dictated the choice of this form of construction. The dimensions decided on were an overall width of 32 ft. 6 in., overall depth of 17 ft. 8 in., inside width of 13 ft. 6 in. for each track, and clearance of 13 ft. over the top of the rail.

A flat roof was chosen in preference to a beamed one to minimise the amount of excavation. Investigation of dead and live loads of the roof structure indicated a need for a centre wall. This contains openings 5 ft. wide by 7 ft. high at 15 ft. centres continuous through the length of the centre wall sections. The openings form a refuge for workmen and help to ventilate the subway; they do not mean a loss of strength and an increase in cost, as the concrete saved more than equalled the cost of forming and the small amount of steel required to convert the wall section over the open-



The course of the subway, showing sections in open cutting as a broken line

port consultant, and the Chicago consulting engineers, De Leuw Cather & Company, the construction of an underground line beneath Yonge Street between Union Station and Eglinton Avenue was recommended. The Commission authorised the development of plans for this line based on the provision of third rail operation. The population of metropolitan Toronto was about 925,000 at the time, the city itself containing about three-quarters of this population in an area of 35 sq. miles.

Toronto is in the form of an inverted T, with the base along the north shore of Lake Ontario. The area of the city and the immediate suburbs within 10 miles of the centre is about 75 sq. miles, containing just over 1,000,000 persons. In accordance with the amalgamation of the 13 municipalities under a Metropolitan Council as from January 1, 1954, the area of responsibility of the Commission was enlarged from the same date to 240 sq. miles and the name changed from Toronto Transportation Commission to Toronto Transit Commission.

As finalised, the scheme called for a line running from a terminus at Front Street in front of Union Station, eastwards to Yonge Street and northwards under that street to College Street, thence to St. Clair Avenue on a right-of-way just east of Yonge Street. The final section from St. Clair Avenue to

later development, but it was decided to build the Yonge Street line for immediate operation by railway-type stock for the reasons that greater capacity would result, the cars could be made more capacious, the line could be operated by trains of up to eight coaches, permitting higher speeds and freeing the service from delays affecting the tramcars on the street sections of their journey. The rolling stock, consisting of 104 cars, has been supplied by the Gloucester Railway Carriage & Wagon Co. Ltd., which gained the contract in the face of strong competition. The cars were fully described in our January 8 issue.

From College Street, which is roughly the northern limit of the business area, the alignment veers about 150 ft. to the east of Yonge Street, and runs in cutting, with a 900-ft. covered way beneath a C.P.R. line, to St. Clair Avenue. In this neighbourhood the problem of alignment was more complex than elsewhere because of the proximity of two cemeteries which entailed diverting the course in a 2,100-ft. covered way from one side of Yonge Street to the other. The existence also of two large masonry churches, two theatres and large business structures, were another complication here, and careful underpinning was necessary.

The decision to build sections in cutting was taken for several reasons, including a considerable saving in cost,

ing to a beam. There is a low pathway on both sides adjacent to the outside wall. Cables are racked up on the walls instead of being placed in ducts as is more usual in American practice.

Cut-and-Cover Procedure

The normal methods of cut-and-cover construction beneath city streets were followed for the subway. First, trenches were dug on each side of the street along the outside lines of the excavation to ensure that mains and conduits were avoided during pile driving. Steel piles were then driven every six feet along the trenches. When the excavation was sufficiently deep, girder beams, or at station sites, steel trusses, were placed on alternate pairs of piles to carry the temporary street decking of 1 ft. x 1 ft. timbers. To hold back the earth at the sides, 3 in. planks were laid horizontally behind the flanges of the piles.

Pipes, mains, and conduits were then supported carefully from the beams, and two temporary sewers were put in at the side of the excavation. The main sewer was removed, its flow having been diverted to a new trunk sewer under an adjacent street.

The excavation was carried down to about 18 ft., with wooden cross-bracing inserted as required and removed after the laying of a 3 ft. concrete slab forming the subway floor. Concrete for the outside wall was poured inside the rows of steel piling and planking. After the central dividing wall and the reinforced concrete roof were completed, the space between roof and roadway was filled with sand, the utilities were restored to suitable positions and new local sewers were laid in outside the subway roof.

Permanent Way

In the open section standard sleeper ballast construction is used, but in the tunnels, where the concrete floor provides a continuous rail support, the rails are bolted to the concrete using a standard steel sleeper plate and rubber pad. Throughout the main line and part of



Train emerging from tunnel section. Note protected third rail

Davisville Yard the rail is 100 lb. A.R.A.-A. section. The remainder of the yard is laid with 85 lb. C.P.R. rail section. The 100 ft. rail is welded into a continuous length unbroken except for insulated joints and special track. On all curves of less than 2,300 ft. radius a check rail is used. The side conductor rail is 150 lb. Bethlehem N.M.C. section, $4\frac{1}{8}$ in. high and with a base width of $4\frac{1}{2}$ in. All lengths of conductor rail, which has a protective wooden covering, were thermit welded with no continuous section longer than 1,000 ft. The voltage is 600.

For reversing trains there are a double crossover at the outward end of each terminus and, for emergency, crossovers in the tunnel sections north of King Station, south of College Station, north of Bloor Station, and south of St. Clair Station. Where the line emerges from the subway a simple facing wall was constructed at right angles to the track to maintain the cutting right-of-way at full width to a point of contact with the underground structure. As far as possible the cutting has 2 to 1 slopes with tracks maintained at 14 ft. centres, as in the subway. All

the retaining walls were originally designed as cantilevers but to reduce the amount of steel required some were built of the gravity type. The bridges carrying streets over the cuttings are of reinforced concrete with a simple fixed frame span, with one or two exceptions.

Although the subway structure is of non-combustible material a fire protection system has been provided, with fire hose cabinets on each platform underground. There are thirteen escalators with a rise of from approximately 9 to 17 ft. and a capacity of between 4,000 and 8,000 persons an hour.

Design of Stations

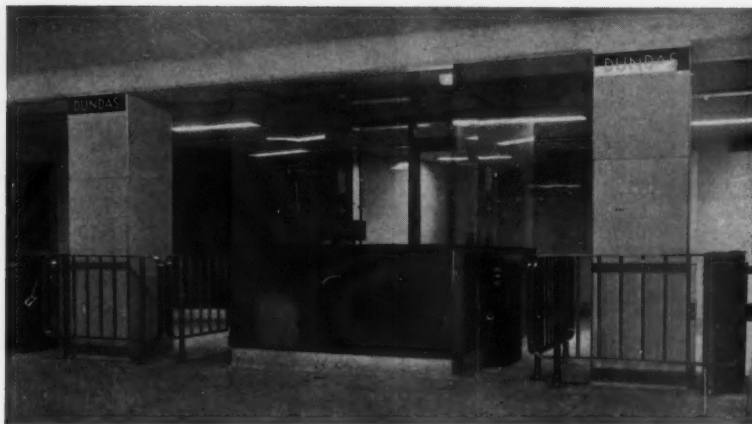
The subway was designed for the operation of 30 trains an hour, with a maximum train length of 500 ft. and platforms 500 ft. long and 12 ft. wide without columns. At the stations the reinforced concrete dividing wall gives place to steel columns supporting a steel beam. At all intermediate stations there are separate platforms for north-bound and southbound lines but the termini have island platforms. All intermediate stations except Dundas have a mezzanine floor between street level and the roof of the subway for the collection of fares and the control of passenger movements. It has reinforced concrete walls and roof similar to the station structure below, but the centre supports of the roof are steel columns so placed that they are easily incorporated in the ticket clerk's office and partition walls. Station walls are finished in coloured glass with a contrasting band carrying the station name frequently repeated. The flooring is terrazzo.

The subway is normally ventilated by the piston action of the trains. There are ventilation shafts at both ends and both sides of each station and also halfway between stations. The intermediate stations have fans with a capacity of 50,000 cu. ft. per minute to cope with unusual air conditions.

Union Station is situated beneath Front Street between Bay Street and the Royal York Hotel. Its island plat-



Passengers boarding a southbound train at an underground station. The fluorescent lighting fixtures shown run the length of the platform



Ticket office and barrier rails directly adjoining platform, Dundas Station

form is connected by two stairways and an escalator to a mezzanine floor from which there are stairs to Front Street and a connection with the main line Union Station.

King and College Stations are identical except for entrance facilities. Both have side platforms connected to a mezzanine floor by stairways and one escalator. Queen Station was designed and built as the hub of a future subway system. As the proposed Queen Street Subway will pass underneath the Yonge Street Subway at right angles, the latter had to be built close to the surface, ruling out a mezzanine floor. The platform area has therefore been extended at the sides to enable fares to be collected on the platform. There are direct passageways to large departmental stores as well as to the pavements.

At Queen, because of the heavy traffic expected, two escalators were installed to permit operation in both directions at the same time; elsewhere the escalators will generally be operated in the up direction only. Part of the future Queen Street Subway, where it passes under Yonge Street, has already been built.

At Dundas, where subsoil conditions prevented the construction of a mezzanine floor, the station has four entrances from the pavements which lead down to two fare-collection areas joining the north- and south-bound platforms.

The seven stations above ground north of College Street have platforms similar to those below ground, but fares are collected and special services accommodated in one-storey buildings at ground level; their design makes liberal use of glass. Those at Bloor and Eglinton will later be replaced by multi-storey buildings erected by private interests. All the above-ground stations allow direct and convenient transfer between the subway and tram, trolleybus, and bus services. Bloor Street has been widened at this point to take two large loading platforms, each long enough to accommodate four tramcars; from these platforms steps lead down

to the subway platforms. St. Clair Station was designed to accommodate a heavy transfer movement of passengers from the services along St. Clair Avenue which are being reorganised to facilitate interchange.

Davisville Station is situated close to the rolling stock yard. The north-bound track has a normal 11 ft. 10 in. wide platform but on the south bound track the platform is 18 ft. 8 in. wide and there is an additional south bound line with a connection to the yard tracks. At Eglinton terminus provision has been made for the transfer of passengers from ten surface routes to the subway. There is an island platform similar to that at Union but it is 29 ft. 8 in. wide to accommodate the heavy volume of passengers. There are four

wide stairways and two escalators. Directly above the concourse are 10 platforms for buses.

Single lamp fluorescent fixtures were selected as the main lighting media. Indoor installations used a 40-watt T.12 hot cathode lamp. Elsewhere the 40-watt T.12 instant start lamp is used. Two basic types of fluorescent fixtures are used throughout all passenger areas. The first is a single lamp, flush-mounted resistance unit for use in control areas with acoustic dial ceilings. The second type is a single lamp, surface-mounted fixture for use on platforms in passageways and at other places where direct mounting on concrete ceilings is required. A continuous row of the surface fluorescent fixtures is installed 3 ft. from the edge of the platform and running the whole length.

Signalling

The contract for the signalling was placed with Siemens and General Electric Railway Signal Co. Ltd., and was the first railway signalling contract in Canada to be secured by a British firm. Work has been carried out in conjunction with the S.G.E. representative in Canada, Radio Engineering Products Limited of Montreal, this firm having been responsible for the installation under the supervision of British engineers.

The main items of equipment supplied comprise automatic colour-light signals, electric point machines, electrically-operated train stops and two relay interlocking panels for the control of signals and points from signal-boxes. All the associated relays are of the S.G.E. detachable plug-in type.



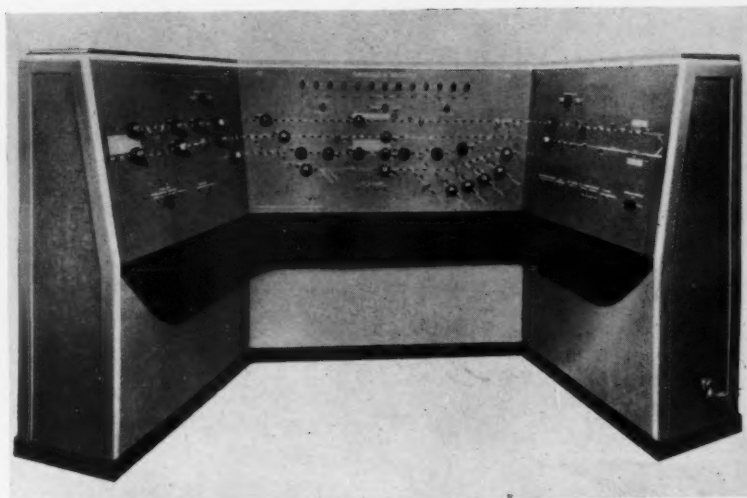
Arrangement of ticket office and barriers at one of the underground stations built with mezzanine floor

There are two interlocking control panels, one at Davisville, the other at Union, with improved indications and operating key arrangements designed to ease the work of the operator and make for increased overall efficiency. The principle of guided light through Perspex is used to permit two or three colours to be displayed in the same indicator aperture, operation being by means of multiple and two-position keys; the whole is mounted on to a panel of Warerite into which is moulded the track diagram. The background is a pleasant shade of greenweave and the panel is recessed into a rolled steel framework finished in stoved cream.

The route is set up by operating the appropriate switches. While the machines on the track are operating, the point indications on the panel are shown flashing white, but when the points are correctly in position the whole route becomes a steady white line of light. Occupation of the track by a train causes the indication to change to red. Signals are repeated in their appropriate colours as red, yellow and green.

Union Station has a scissors crossover and the incoming and outgoing signals controlled from a small interlocking plant; outside these limits the signalling is operated automatically by the passage of trains until the interlocking area at Davisville is reached. Davisville, the largest station, with three platform faces, has an interlocking plant which controls all points leading to the storage tracks and also those to the carriage sheds. In addition Eglinton terminal is controlled from the Davisville interlocking control panel.

All tracks are equipped with track circuits and throughout the automatic section three-aspect colour-light signals are used. They display red—stop; yellow—proceed with caution, prepared



S.G.E. interlocking control panel for the Davisville-Eglinton area

to stop at the next signal ahead; and green—proceed. Automatic train stops are associated with each running signal.

The scissors crossings on the automatic sections are for use in an emergency when it may be necessary to turn trains back. Should occasion demand the south- or north-bound tracks can be isolated to make single-line operation possible to the next crossover while still under complete control. The crossovers are electrically released but hand-operated.

At the interlocking two three-aspect signals are generally used. The upper unit of three aspects is interpreted by the driver in the same way as those in the automatic sections, while the lower three aspects are intended to describe the route to be followed. When required call-on signals are fixed under

the main signal, consisting of a single aspect, displaying yellow when clear to proceed.

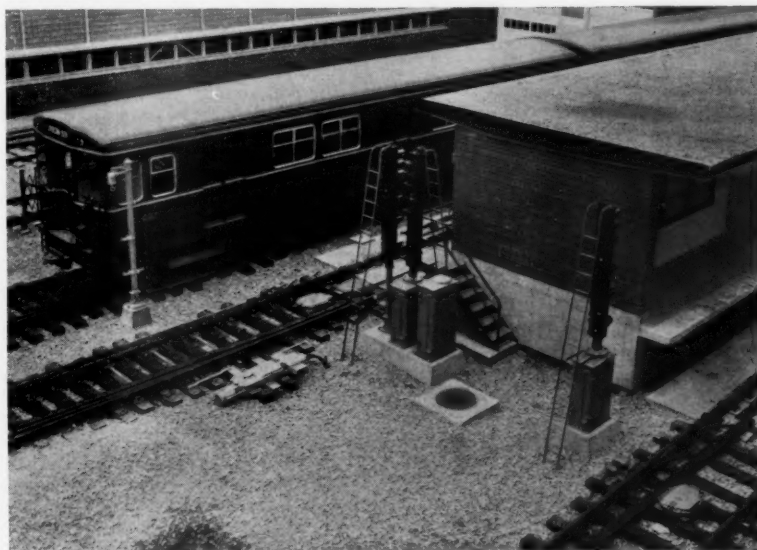
At the terminal stations the controlling circuits are so arranged that the signalling system, when required, may be switched to the automatic operation of points and signals, the setting for each train movement being responsive to the occupancy and clearance of certain track circuits; in addition to this an automatic train despatcher may be used.

Maintenance Centre

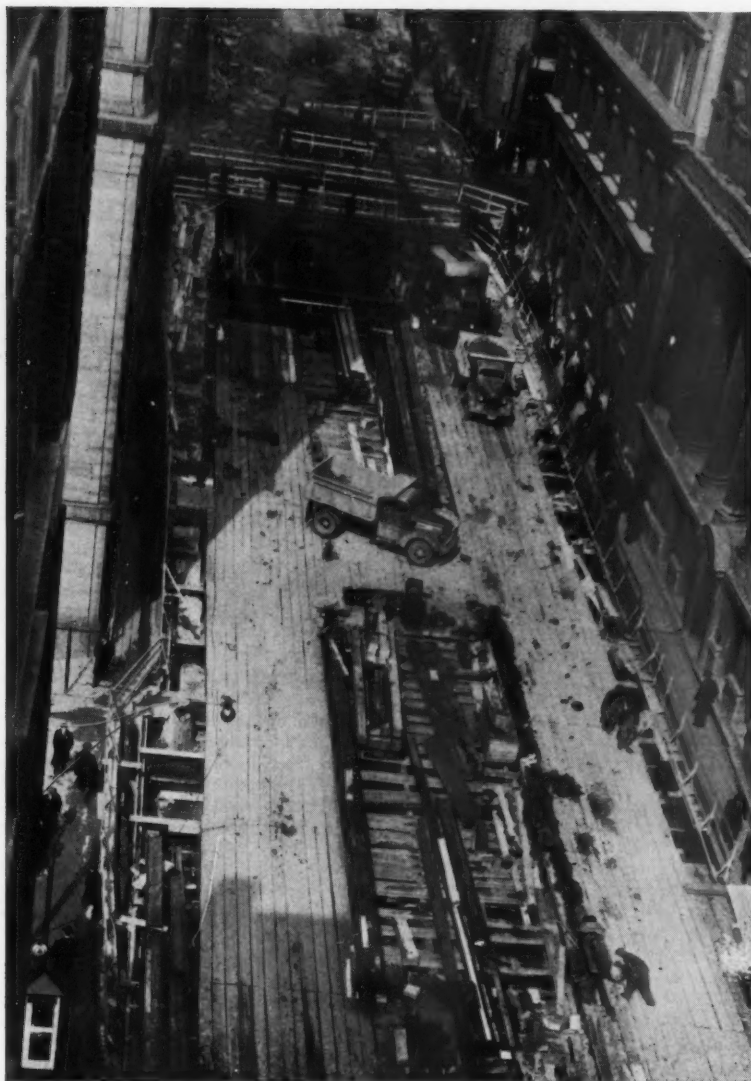
Davisville is the maintenance centre of the system. There are buildings for the inspection and repair of the rolling stock, buildings for the Way & Structures Department, and a boiler plant. The yard extends for a distance of approximately 2,700 ft. and is roughly triangular in shape. Because of confined space not all the yard tracks are laid parallel to the main line nor could they be placed at right-angles to Yonge Street. Two curves in the main line, however, complicate the layout.

The repair shop at Davisville is a red brick building with a flat roof and covers an area of 69,000 sq. ft. The interior is illuminated by suspended fluorescent lighting fixtures. It is equipped to carry out all running repairs such as wheel grinding, minor body repairs, oiling and greasing. A drop pit running at right-angles under the westernmost three tracks facilitates the speedy removal of car bogies and motors for repair and shortens the period in which the unit is out of operation. Heavy repairs will be undertaken at the main shops of the Commission at Hillcrest.

The yard can store 104 cars. This storage is concentrated mainly in the lower end of the yard on five tracks 600 ft. long. To the west of the yard is the maintenance of way building and yard constructed for the handling and delivery of materials as well as for



View from Davisville signal tower, showing electric point machine, train stop and colour-light signals



Temporary wooden roadway on steel beams being laid in Yonge Street while excavation is in progress beneath

storage of rails, switches, and frogs. Operation of the yard is controlled by hand-operated points and electrically-controlled interlocked points on main line connections. The yards and depot occupy 15 acres.

The car maintenance building is of concrete, steel, and brick construction with prefabricated concrete roof sections. The south end has nine electrically-powered overhead doors of wooden construction; as five of the nine tracks are terminal there are only four such doors at the north end of the building.

As the third rail stops about 30 ft. outside all except two of the track entrance doors the remaining seven tracks inside the building are equipped with 600-V. overhead trolley jumpers, with one flexible connection provided for each car space. The two easternmost through tracks in the building are

divided off by a tiled wall to form the car washing and cleaning section. The third rail is carried through both of these tracks to facilitate train movement. In the main part of the building are two inspection pits each accommodating eight cars, and there are also two pits with a capacity of one four-car train, equipped with high-speed wheel grinding machines designed and manufactured by the Commission.

The repair and unit change section comprises three tracks, two of which have pits 220 ft. long. The third track at floor level is used for wheel and axle storage, bogie repairs, motor changing, and so on. A monorail crane controlled from floor level traverses the whole length of this track. The drop table installation consists of three table tops, one in each of the three repair pits. The tops are raised and lowered by a power-driven hoist mounted on a

power carrier which runs on a track beneath and at right angles to the running lines. At the north end of the bogie repair track there is a large capacity hydraulic hoist to facilitate consignment of bogies to Hillcrest for major repair.

The storage yard has 19,000 ft. of track and 41 points, 16 of which are electric and controlled by a despatcher in a glass-walled room on the upper elevation on the east side of the centre. The boiler house supplies heat to all the buildings except the maintenance of way building; coal for the two stoker-equipped boilers is dumped directly into storage containers from railway hopper wagons.

Two clusters of 1,000-watt searchlights mounted on two 60-ft. poles and 500-watt duoflood lights on the top of the concrete retaining walls illuminate the yard. The top side of all conductor rails within the yard is protected by a wooden guard. In an emergency the many emergency push-button stations and point isolating stands throughout the yard enable sections to be isolated as required.

Service Frequency

The service interval on weekdays is expected to vary between 2½ and 3 min. Four-car trains will probably be operated in normal hours and six-car trains at peak periods. An oral two-way communication system will be used in the yard to facilitate the movement of trains to and from the "build-up" track and the car maintenance building. To begin the day's service trains will be placed at Eglinton Station. As platform trackage becomes available additional trains will be brought from Davisville Depot until the full complement of rolling stock is placed in service.

At the end of the operating day all trains will run out of service southbound from Eglinton to Davisville. When it is necessary to lengthen or shorten trains in service the train affected will be diverted to the west side of the southbound platform at Davisville Station on to a "build-up" track connected with a stub track extending to the north where sets may be stored ready for immediate service. All movements connected with these operations will be controlled by a despatcher in a tower in the yard.

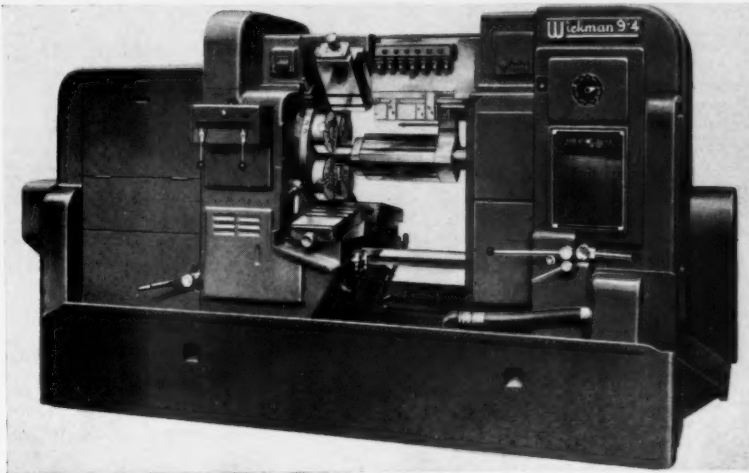
The total cost of the whole project has been approximately \$50,500,000. The cut-and-cover under Yonge Street with concrete subway structure has cost some \$9,000,000; cut-and-cover on private right-of-way with concrete subway structures \$6,400,000; construction in cutting on right-of-way \$3,700,000.

British contractors who have been associated with the project include:—

Rolling stock	...	Gloucester Railway Carriage & Wagon Co. Ltd.
Signalling	...	Siemens and General Electric Railway Signal Co. Ltd.
Telephones	...	General Electric Co. Ltd.
Cables	...	Pirelli-General Cable Works Limited.
Vitrolite	...	Pilkington Bros. Ltd.
Reinforcing Steel	...	Square Grip Reinforcement Co. Ltd.

New Wickman Chucking Automatics

Designed for accurate machining of castings, billets, and pressings



Wickman four-spindle chucking automatic for machining castings and forgings up to 9 in. dia.

TWO new large chucking machines have recently been completed by Wickman Limited, as a further extension to their range of multi-spindle automatics, which are designed for fast, accurate, and economical machining of castings, forgings, billets, and pressings. Developed from the four- and six-spindle series of bar automatics, the new chucking machines provide 9-in. chuck capacity in a four-spindle version and 7½-in. capacity in a six-spindle arrangement.

Design Characteristics

Many of the features which have characterised the Wickman range for many years are incorporated, among them being the patented lever adjusting mechanisms for alteration of tool-feed strokes without changing cams. The new machines are extremely heavy and rigid, total weight without tooling being approximately 12 tons.

Power is supplied by a 30-h.p. 960 r.p.m. foot-mounted motor on a hinged platform, the drive being transmitted by heavy matched vee-belts. Spindle speeds in 24 steps range from 29 to 473 r.p.m. on the four-spindle machine, and 51 to 675 r.p.m. on the six-spindle machine. Power, and feed and speed ranges, have been chosen to cover the widest field of use and to enable the fullest possible exploitation of carbide tooling.

The spindles are heat-treated steel forgings designed with large integral flanges for mounting chucks and run in extra precision taper and parallel roller bearings. A large multi-plate clutch and brake operated by an individual fork is fitted to each spindle. The air cylinders have a long draw-bar stroke and are of the tandem type on the six-

spindle machine and single type on the four-spindle machine. Each is provided with its own combined running joint and valve of new design, a simple reversing valve for external or internal gripping control, and a pressure safety switch which can be arranged to trip the feed if air pressure falls below a pre-set minimum safety value.

Chuck and Clutch Control

Light action levers electrically control the air cylinders which operate the spindle clutch, brake, and chuck, interlocks to prevent incorrect sequence being fitted. Under normal operating conditions (with no tooling in the loading station) the spindle is automatically stopped after completion of indexing

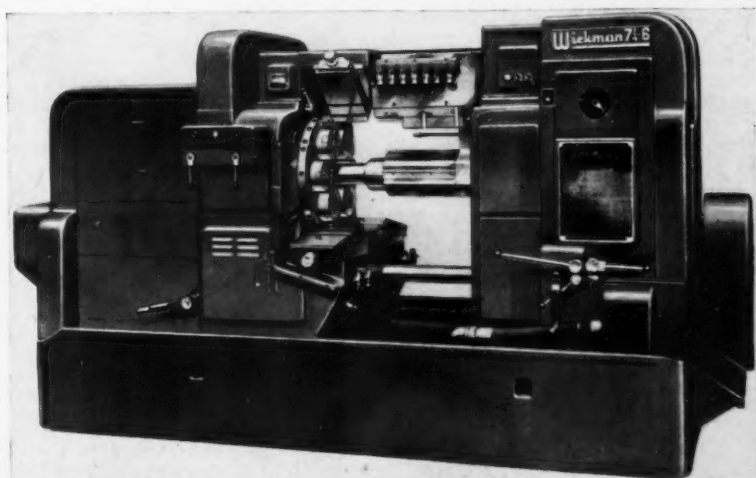
ready for unchucking the completed work. When accelerated end working tooling is used in the loading station, adjustable timing cams stop the spindle automatically only when tools are clear of the work. Operator safety is ensured by two hand push-button controls linked with a warning light system, and a mechanism which trips the feed clutch automatically before indexing if the buttons have not been depressed. Chucks are supplied with interchangeable hardened base jaws and wedges with optional wedge angles to provide greatest gripping power or greatest movement.

Loading

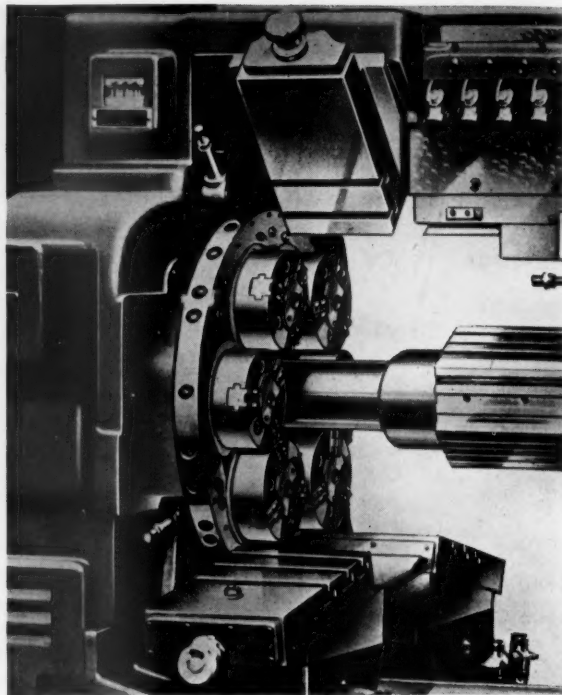
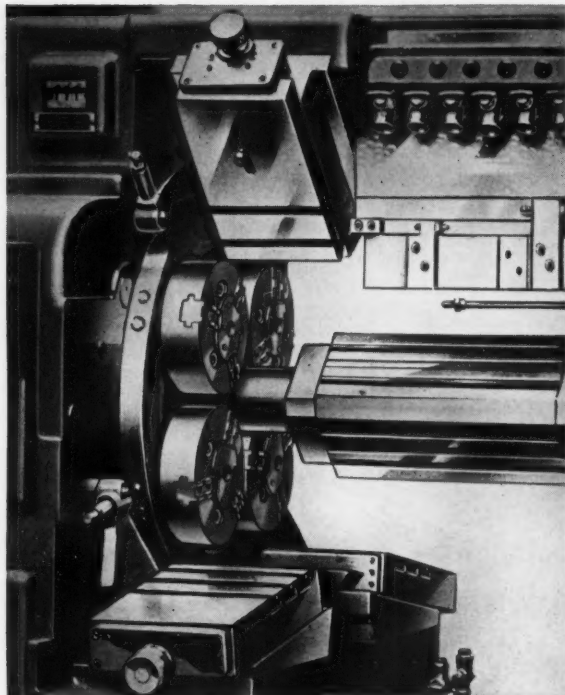
Loading is performed right-handed at station six on the six-spindle machine and station four on the four-spindle machine. Indexing is anti-clockwise so that the heavier roughing operations are carried out on the lower stations. Double indexing can be arranged on the six-spindle machine, loading then being carried out at stations five and six with individual controls to each station.

Cross-slides are fitted as standard in stations one and two and, if required, in stations four and five on the six-spindle machine and stations three and four on the four-spindle machine. All cross-slides have micrometer adjustment and are provided with a master stop engaging stop screws in the spindle drum. The main tool block is provided with a dead stop and step-by-step end-wise adjustment so that the position most favourable to the set-up can be used, dependent upon length and swing of work, stroke, and tooling.

Independent upper end-working slides are also available in stations four and five on the six-spindle machine and three and four on the four-spindle



The six-spindle version of the Wickman 7½-in. chucking automatic



Wickman chucking automatics, showing (left) the tooling area on the four-spindle automatic and (right) the tooling area on the six-spindle machine

machine. Standard toolholders are available for a wide range of tools which in many cases are interchangeable between stations and machines of

both bar and chucking type. Attachments for high-speed drilling, independent reaming, plain threading with self-opening revolving diehead or full

threading with solid taps and dies are available. The maximum air line pressure is 100 lb. per sq. in.; maximum consumption is 7 cu. ft. per min.

Automatic Welding Blowpipe

Thumb control for supply of oxygen and dissolved acetylene

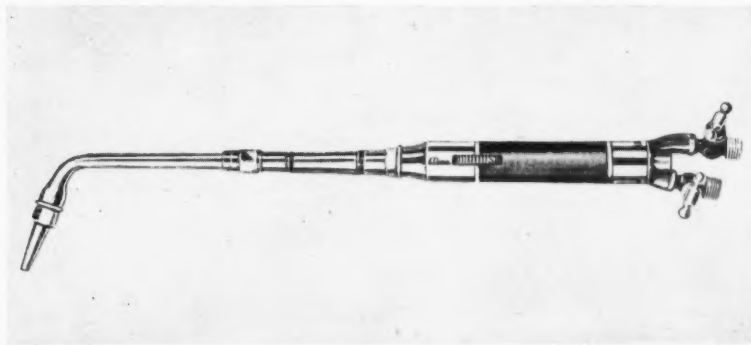
WITH the conventional blowpipe the correct flame—neutral, oxidizing or carbonizing—is obtained by the operator setting the recommended pressure readings on the outlet gauges of both oxygen and acetylene regulators and then manipulating the blowpipe valves. During progress of welding operations it is frequently necessary, because of positioning or adjustment of work piece, to withdraw blowpipe flame, possibly

only for a minute or so, during which time valuable gases are needlessly burned to waste, or alternatively, gases are shut off and much time is lost in consequent flame re-adjustment.

Flame Adjustment

The automatic welding blowpipe shown in the accompanying illustration is designed to eliminate this wastage of time and gases. The blowpipe retains

all the characteristics of the range of B.I.G. welding blowpipes and is operated in exactly the same manner when once the original flame adjustment has been made. The operator controls his supply of oxygen and dissolved acetylene simply by moving the thumb control backwards and forwards. The forward movement brings the full welding flame on, while the backward movement shuts it off leaving only a very small pilot light. Manufactured by British Industrial Gases, Limited, 32, Victoria Street, London, S.W.1, the Automatic blowpipe is available in two sizes, models 16 for welding up to $\frac{1}{4}$ in. mild steel plate and model No. 17 for heavier sections. The standard range of welding tips series 1390 is suitable for use with both models.



Automatic blowpipe model 16 for welding up to $\frac{1}{4}$ -in. thick mild-steel plate

CENTRAL WAGON CO. LTD.—The group profit for the year ended September 30, 1953, of the Central Wagon Co. Ltd. was £82,509. That of the former holding company and its subsidiaries for 1951-52 was £123,185. A dividend is recommended of ten per cent, less tax, on the £750,000 one-class capital; an interim of five per cent, less tax, was paid in June.

RAILWAY NEWS SECTION

PERSONAL

H.R.H. The Duke of Gloucester, K.G., has consented to be Patron of the Society of Engineers (Incorporated), which celebrates its centenary this year.

The following new posts and appointments have been made in the East African Railways and Harbours Administration:—

Mr. W. Urquhart, O.B.E., B.Sc., M.I.C.E., Chief Engineer, becomes Deputy General Manager.

Mr. G. P. G. Mackay, M.A., Principal Assistant, becomes Chief Assistant. This is a new position, which supersedes, with enhanced status, the existing post of Principal Assistant.

Captain C. W. Hamley, O.B.E., R.N. (Ret.), Superintendent of Ports and Lights, is retiring in October. This post is to be superseded by that of Chief Ports Manager.

The appointment to the new post of Ports Assistant to the General Manager at Headquarters has yet to be announced.

Mr. C. W. Leverett, Regional Officer, has been appointed Regional Representative, Dar es Salaam. This post is also newly-created, and supersedes that of Regional Officer. A new post of District Traffic Superintendent will be created at Dar es Salaam to take over certain operating duties now covered by the Regional Officer.

Sir Brian Robertson, Chairman of the British Transport Commission, has accepted an invitation from the Chairman and Council of the Transportation Club to become an Honorary Member.

The Minister of Transport & Civil Aviation, the Rt. Hon. Alan Lennox-Boyd, M.P., has appointed Mr. A. M. C. Jenour, T.D., J.P., who is a representative of commerce, to be a member of the Transport Users Consultative Committee for Wales and Monmouthshire.

Mr. A. E. H. Brown, Chief Docks Manager, South Wales Docks, has been re-elected to the Chairmanship of the South Wales Executive Committee of the Industrial Association of Wales & Monmouthshire.

GREAT NORTHERN RAILWAY BOARD.

Consequent on the retirement of Mr. C. H. Slater, Civil Engineer, the Great Northern Railway Board, of Ireland, has made the following appointments:—

Mr. W. H. C. Stone, Civil Engineer.

Mr. T. A. Carson, Assistant Civil Engineer.

Mr. H. C. A. Beaumont, District Engineer, Enniskillen.

Mr. F. J. Frost has been appointed Head of the Administration of Advertising on Road Vehicles in the Commercial Advertisement Division of the Department of the Chief Public Relations & Publicity Officer, British Transport Com-

mission, in succession to Mr. R. W. Jolley whose appointment as Sales Promotion Officer has been recorded.

Mr. H. H. Phillips, A.C.I.S., M.Inst.T., formerly Chief Commercial Officer, Railway Executive, who, as recorded in our March 12 issue, has been appointed Assistant Chief Regional Manager, Western Region, British Railways, joined the Great Western Railway in 1908. As a member



Mr. H. H. Phillips
Appointed Assistant Chief Regional Manager,
Western Region

of the General Manager's personal staff until 1932 he gained wide experience of railway administration and for some years had charge of the section dealing with freight rates and charges, passenger fares, docks and steamboats, rolling stock and general subjects. He also acted as Secretary of the Cork City Railways before their acquisition by the Great Southern Railways of Ireland. In 1932 Mr. Phillips was transferred to the office of the Superintendent of the line to reorganise excursion and cheap ticket facilities, and was largely responsible for the introduction of monthly return tickets. Becoming Assistant Divisional Superintendent, Cardiff, in 1937 and Divisional Superintendent in 1941, he was appointed Assistant to the Superintendent of the Line (resident in South Wales) in 1946. In 1950, Mr. Phillips was transferred to the Railway Executive and appointed Chief Commercial Officer. In 1953, at the request of the Premier of Tasmania, he visited Australia for the purpose of undertaking an investigation in-

to the working of the Tasmanian Government Railways and made recommendations designed to effect a substantial improvement in the financial position of that undertaking. As from February 1, 1954, he returned to the Western Region to take up his new appointment.

We regret to record the death of Mr. Sidney Henry Edward Ellis, formerly Chief Signal Engineer of the Buenos Aires & Pacific Railway. Mr. Ellis, who was born at Croydon in 1890, left for Argentina in 1911 as an assistant in the Chief Engineer's Department, occupying posts of increasing responsibility until attaining that from which he retired in 1949.

We regret to record the death in Rio Negro, Argentina, of Mr. George William Munday, formerly Deputy Chief Electrical Engineer of the Buenos Aires Great Southern & Buenos Aires Western Railways, who retired from railway service in 1948.

Mr. P. C. DURRANT

On Monday evening, Mr. P. C. Durrant, who retired from the office of General Agent of British Railways in France at the end of March, was entertained by a number of friends and colleagues at the Transportation Club, London, S.W.1. Mr. R. H. Hacker, Chief Officer (Continental), British Transport Commission, presented Mr. Durrant with a gift for his wife and expressed the gratitude of those present for the many courtesies which have been extended to them by Mr. Durrant during his term of office and their good wishes for his retirement.

Mr. H. C. Talbot, Agent, Brussels, British Railways, has been appointed General Agent for France, vice Mr. P. C. Durrant, retired.

Mr. F. R. L. Barnwell, O.B.E., A.M.I.C.E., District Engineer, Shrewsbury, Western Region, British Railways, has been appointed to Newport in a similar capacity.

Mr. A. S. Turner, A.M.Inst.T., A.M.I.R.S.E., Assistant to District Traffic Superintendent, Chester, London Midland Region, British Railways, has been appointed Assistant District Operating Superintendent, Leeds City, North Eastern Region.

The following appointments have been announced by the Southern Region, British Railways:—

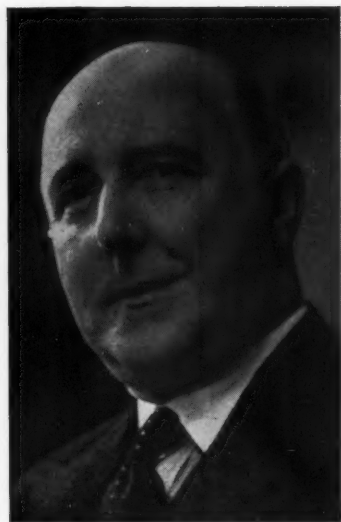
Continental Department

Mr. J. S. Healey, Assistant to Docks & Marine Manager, Dover, to be Agent, Calais.

Mr. A. J. Baldwin, Agent, St. Malo, to be Agent, Boulogne.

Mr. G. F. Powell, Clerk, Paris, to be Agent, St. Malo.

All these appointments are effective April 1, 1954.



Mr. H. Bolton

District Commercial Superintendent, Bristol, Western Region, who has retired



Mr. C. R. Bennett

Appointed District Operating Superintendent, Liverpool Central, L.M. Region



Mr. R. W. Coatesworth

Appointed District Estate Surveyor, York, N.E. Region

Mr. Hubert Bolton, District Commercial Superintendent, Bristol, Western Region, British Railways, who, as recorded in our March 12 issue, retired on March 29 after over 50 years of railway service, joined the Great Western Railway in the Goods Department at West Bromwich in January, 1904, and had subsequent experience at Wednesbury and Birmingham. He was selected for a four years course of special training in 1922, gaining experience in the Goods, Traffic, Docks, and Road Transport departments. On completion of the course in July, 1926, he was attached to the Development department of the Chief Goods Manager's office at Paddington, and, later that year he was appointed Goods Agent at Malvern Link. In April, 1928, he returned to Paddington on promotion to the Chief Goods Manager's Development department, and, after a period of intensive training on the com-

mercial side, he became G.W.R. Freight Agent for the United States and Canada with headquarters in New York, leaving this country in August, 1930, to take up these duties. After two years, Mr. Bolton returned to England and spent a short while in Bristol. He was then called to London to take over the position of Staff Clerk to the Chief Goods Manager. In February, 1935, he returned to Bristol and, in January, 1936, was made Chief Clerk to the District Goods Manager. In August of the same year he became Goods Superintendent, Bristol, Temple Meads Goods Station, being appointed Assistant District Goods Manager, Bristol, in March, 1940. His appointment as District Goods Manager, Gloucester, came in November, 1941, and he transferred to a similar position at Newport in October, 1945, returning to Bristol as District Goods Manager in July, 1946. After nationalisa-

tion, certain reorganisation was effected, and, on March 1, 1950, Mr. Bolton also took over the responsibility at district level for all commercial matters affecting passengers and parcels traffics. As from February 1, 1951, the commercial activities of the former London Midland Region, Bristol District, Bristol to Wickwar and Bath and Bath to Cole (ex-S. & D.) inclusive were placed under Mr. Bolton's supervision. Mr. Bolton is a Member of the Institute of Transport, and Chairman of the Western Section.

Mr. C. R. Bennett, Assistant District Operating Superintendent at Euston, London Midland Region, British Railways, who, as recorded in our February 26 issue, has been appointed District Operating Superintendent at Liverpool Central was educated at Palmers School, Grays, and entered the service of the L.M.S.



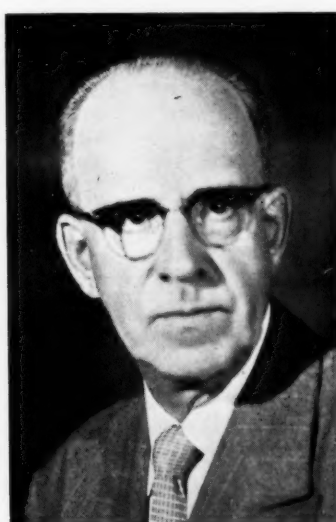
Mr. T. J. Gracey

Comptroller, Canadian National Railways, 1950-54



Mr. R. D. Armstrong

Appointed Comptroller, Canadian National Railways



Mr. Charles Hassell

Engineer of Car Equipment, Canadian Pacific Railway

Railway as a junior clerk at Tilbury Dock station in 1923. After a number of years' experience at passenger and goods stations, he moved to the London District Passenger Manager's Office and, in 1932, to the Chief Operating Manager's Office at Euston. Mr. Bennett continued for twelve years in passenger and freight sections of the L.M.S. Operating Headquarters and, in 1944, he was posted to Birmingham (Saltley) as District Inspector. In 1945 he went to Peterborough as Assistant District Controller, the following year was appointed Assistant to the District Operating Manager at Gloucester, and, in 1948, to a similar position at Liverpool Lime Street. On the incorporation of the Cheshire Lines Committee into the Western Division of the L.M.R. at the end of 1948, Mr. Bennett became the first Assistant District Operating Superintendent at Liverpool Central, to which point he now returns in his new capacity, having been Assistant District Operating Superintendent at Euston since March, 1952.

Mr. R. W. Coatesworth, A.R.I.C.S., who, as recorded in our March 19 issue, has been appointed District Estate Surveyor, York (York - Middlesbrough District), North Eastern Region, British Railways, commenced his railway service with the L.N.E.R. on the staff of the Estate & Rating Surveyor, York, in 1936. He was appointed to a position in the Southern Area office at Liverpool Street in 1945. Three years later, in 1948, he passed the final examination of the Royal Institution of Chartered Surveyors, and was elected Professional Associate of that Institution in the same year. Promotion to Assistant District Surveyor, Nottingham, followed later in 1948, and in 1950 he became Assistant District Surveyor, Manchester, Eastern Region. He moved with the Manchester office to Retford at the end of 1950, and leaves Retford to take up his new post at York. His appointment dates from March 15.

Mr. T. J. Gracey, Comptroller, Canadian National Railways, who, as recorded in our April 2 issue, retired on March 31, has, during almost a half-century of railway service, advanced from a junior position to head of the accounting department of the system. Mr. Gracey has played an important part in the development of railway accounting practices both in Canada and the United States. He has served for many years on a committee of the accounting division of the Association of American Railroads. A native of Kingston, Ontario, Mr. Gracey joined the Temiskaming & Northern Ontario Railway (now Ontario Northland) in 1906 at North Bay and was made Auditor at Toronto in 1915. He moved to the C.N.R. in 1920 as Assistant Auditor of Disbursements, later becoming Regional Auditor at Winnipeg, Auditor of the Grand Trunk Western Railroad at Detroit, and Assistant Comptroller for the system at Montreal. He was appointed Comptroller in 1950.

Mr. Robert Douglas Armstrong, Associate Comptroller, Canadian National Railways, who, as recorded in our April 2 issue, has been appointed Comptroller, brings to his new position a wide knowledge of accounting methods and procedures. Mr. Armstrong was born in Ottawa in 1918, and he holds a Bachelor of Commerce degree (Queen's). He became a chartered accountant in 1941 while working with Price, Waterhouse & Company. He gained extensive experience in the creation of accounting organisations, development of

cost reporting and budget control systems during six years of association with Imperial Oil when he was engaged principally in directing and devising accounting procedures for the company's oil exploration and development in Alberta. Before joining the Canadian National Railways on June 1, 1953, Mr. Armstrong was Director of Finance & Administration for A. V. Roe Limited at Toronto. In that position he initiated and installed accounting systems for aircraft and gas turbine development, tooling and manufacturing on a large scale. He has been engaged in financing operations, contact negotiations and the installation of capital budget and other accounting systems. In 1942 Mr. Armstrong enlisted in the Canadian Army as a private. On demobilisation he held the rank of lieutenant.

Mr. Charles Hassall, Engineer of Car Equipment, Canadian Pacific Railway, who, as recorded in our February 5 issue, has taken over the duties of the Mechanical Engineer (Car) in addition to his own, joined the C.P.R. in 1910 as a Machinist Apprentice at Angus Shops, Montreal. After serving overseas in the 1914-18 war, he became a draughtsman in 1920. He was appointed Chief Draughtsman in 1939, Assistant Engineer in 1941 and Assistant Mechanical Engineer in 1948. In 1951 he was appointed Engineer of Car Equipment.

The following staff appointments have been announced by London Midland Region, British Railways:—

Mr. E. H. Baker, Assistant Divisional Motive Power Superintendent, Derby, to be Divisional Motive Power Superintendent, Crewe.

Mr. R. Thompson, District Motive Power Superintendent, Edinburgh (Scottish Region), to be Divisional Motive Power Superintendent, Manchester.

Mr. A. M. Y. Robb, Assistant District Operating Superintendent, Rotherham (Eastern Region), to be District Operating Superintendent, Manchester.

We regret to record the death, at the age of 74, of Mr. H. J. Chaytor, who was for a number of years District Engineer at the Liverpool Contracts office of British Insulated Callender's Construction Co. Ltd., and, at his retirement in June, 1940, District Engineer at Manchester, having served 47 years with the company.

Mr. H. N. Norbury has been appointed Sales Manager of the Parsons Engineering Co. Ltd. with effect from March 22. By arrangement with the Board of Directors of Henry Meadows Limited Mr. Norbury has been released from his appointment as Sales Manager to that company to enable him to take over his new responsibilities in Southampton.

The Skefko Ball Bearing Co. Ltd., announces that Mr. L. M. Ballam, hitherto Senior Representative at the company's London office, has been appointed as Manager at Bristol in succession to Mr. E. Y. Caswell, who, as recently recorded, has been transferred to the company's Head Office Staff in the capacity of Sales Manager.

Mr. S. A. Brazier, Technical Manager of the General Rubber Goods Division, Dunlop Rubber Co. Ltd. has been appointed Technical Consultant of the division. He continues his membership of the company's Development & Research Board and of the local board of the General Rubber Goods division. Mr.

Brazier's duties as Technical Manager will now be shared by Mr. E. H. Hurlston, Factory Technical Manager, and by Mr. F. W. Warren, Deputy Technical Manager, who becomes Development Manager in charge of laboratories. Mr. Warren is also appointed to the local board of the General Rubber Goods Division.

We regret to record the death on March 20, of Mr. Arthur C. Mengel, Chief Chemical Engineer of the American Locomotive Company.

Mr. W. H. Taylor, A.M.I.E.E., has been appointed Controller of Education and Personnel Services, General Electric Co. Ltd.

Mr. Montague Burningham relinquished his office of Joint Managing Director, Keith Blackman Limited, on March 31. He will retain his Directorship and remain Chairman of the company. Mr. Donald S. Woodley, M.I.Mech.E., M.I.H.V.E., becomes Managing Director as from April 1.

Mr. George Rushton, Sales Manager of the Roller Bearing Division, Geo. Salter & Co. Ltd., has been appointed, additionally, Sales Manager of the Retaining Ring Division.

Mr. John Edward Plackshaw has resigned as Managing Director of G. D. Peters & Co. Ltd., but will retain his seat on the board and be available in a consultative capacity.

Mr. V. R. Prehn, Works Director, Ruston & Hornsby Limited, has been appointed Assistant Managing Director. Mr. G. B. R. Feilden, Chief Engineer, Gas Turbines, has been appointed Engineering Director.

Mr. Barrie Heath has been appointed to the board of the Cambrian Wagon & Engineering Co. Ltd. Mr. Heath is also Managing Director of Powell Duffryn Carbon Products Limited.

We regret to record the death on March 26, at the age of 51, of Mr. H. V. Bennis, for many years on the staff of the control gear engineering department of British Thomson-Houston Co. Ltd. at Rugby. Mr. Bennis joined the company in 1917 as an engineering apprentice.

Mr. Maurice Tattersfield, A.C.A., F.C.C.S., has been appointed Deputy General Manager of the Loughborough works of the Brush Electrical Engineering Co. Ltd. He assumes his new duties in April and will be a member of the Executive. Mr. Tattersfield joined the Brush Group in 1953, as Group Controller of Accounts.

Metropolitan-Vickers Electrical Co. Ltd., states that its vacuum products activities have been merged with the new Products Department, which has been renamed the Scientific Apparatus Department. The following appointments in that department have been announced:—Mr. J. Blears, Chief Engineer; Mr. R. S. Clark, Assistant Superintendent; Mr. J. W. Buckley, Sales Manager; and Mr. W. J. Brown, Assistant Sales Manager.

The following executive changes to take effect from May 1 have been announced by Henry Wiggin & Co. Ltd.:—

Mr. J. O. Hitchcock relinquishes his position as Assistant Managing Director

of the Wiggin company to assume the position of Assistant to the Chairman of the Mond Nickel Co. Ltd. He remains a member of the Wiggin Board.

Mr. H. W. G. Hignett, Superintendent of the Mond Nickel Company's Development & Research Laboratory, has been appointed to the Wiggin Board and will take charge of technical (metallurgical) control and development in all the Wiggin plants. He is succeeded as Superintendent of the Laboratory by Mr. H. Evans.

Mr. R. E. Ansell, Manager of the Sales Department, becomes a member of the Wiggin Board.

Mr. O. Lewis Jones will become General Production Manager, responsible for production in all the Wiggin plants. He is succeeded as Works Manager at Birmingham by Mr. C. E. Winfield.

Some changes at the Zenith Works, Glasgow, are also announced. The General Manager, Mr. A. B. Graham, will relinquish this position on July 1 but will continue with the organisation to undertake special duties in connection with production. He will be succeeded as Works Manager at Zenith by Mr. R. J. P. MacDonald.

Mr. Eric Korner has joined the board of the Manila Railway Co. (1906) Ltd.

Mr. R. D. G. Ryder has been elected President of the Machine Tool Trades Association, Mr. H. P. Potts has been elected Vice-President, and Mr. G. E. Hickman, Honorary Treasurer.

INSTITUTION OF CIVIL ENGINEERS

Mr. V. D. Dennis, B.Sc.(Wales), Stud.-I.C.E., Bridge Section, Civil Engineer's Office, Western Region, British Railways, has been elected a graduate of the Institution.

Mr. B. K. S. B. Hartshorne, B.A.(Cantab), Sir William Halcrow & Partners, Accra, Gold Coast, British West Africa, has been elected an Associate Member of the Institution.

UNITED KINGDOM TOURIST EARNINGS—In the five years since 1949, Britain's receipts from tourism totalled £500,000,000 of which £140,000,000 was in U.S. dollars, Sir Alexander Maxwell, Chairman of the British Travel & Holidays Association has declared. Although the industry's best year was 1953 he did not believe that the increase was due solely to the Coronation. He was confident that the industry would do even better in 1954.

PROFESSIONAL ENGINEERS APPOINTMENTS BUREAU—The names of over 7,600 engineers were submitted by the Professional Engineers Appointments Bureau for vacancies notified during 1953 in civil, mechanical, and electrical engineering. In civil engineering there was a well maintained demand for graduate civil engineers for design work, particularly with consulting engineers. There was an increase in the number of overseas vacancies compared with 1952. Men with production, design and development experience in the light industries were in demand among mechanical engineers, but there were fewer vacancies for semi-commercial and administrative posts which seemed to be the first choice of many candidates. In electrical engineering, vacancies in the light current field predominated and engineers with electronic experience were relatively easy to place. The problem of placing the older engineer is still acute.

New Research and Development Laboratories of the Quasi-Arc Co. Ltd.

Additional facilities provided for the work of the electrode section

New research and development laboratories at the Bilston Works of the Quasi-Arc Co. Ltd. were opened by Mr. J. S. Hutchison, Chairman of the British Oxygen Group of companies, on March 31. The Quasi-Arc Co. Ltd., established in 1911, is the largest manufacturer in the Commonwealth of electrodes and equipment for arc welding. In research it has a long record of success. Armour plate was first successfully welded with electrodes developed and manufactured by the company.

Spread of Arc Welding

The use of arc welding has increased four-fold in the engineering industry during the past 15 years. Quasi-Arc production is six times that before the war, and continued research is being directed towards developing more efficient designs and manufacturing methods for both electrodes and welding equipment. The company's electrode manufacturing plant has been made by the company to its own designs and incorporates patented features. The factory at Bilston is equipped with a high-speed mechanised system manufacturing electrodes of high quality and at low cost. As a result, although costs of raw materials are now about three times greater than before the war, prices of Quasi-Arc electrodes are only 70 per cent more.

There is now a Quasi-Arc electrode for almost every known welding application, and the company continues to improve the design of arc welding generators, transformers and accessories. It is now expanding its activities to the development of other equipment and processes, including selenium plate rectifiers to provide an efficient source of direct current for welding,

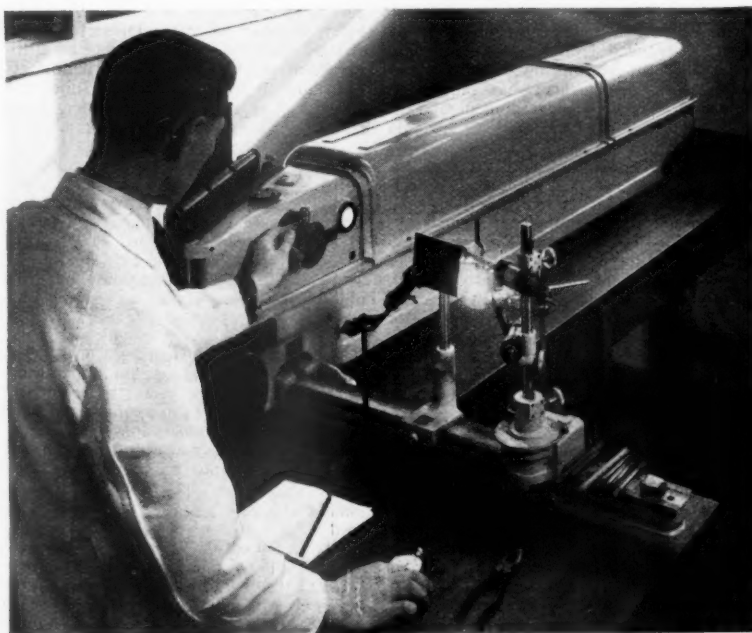
and into the field of argon arc welding. An important part of the company's activities is in fostering more widespread knowledge of the possibilities of electric welding through promotion of efficient design for work to be fabricated by welding, with guidance to users on technical problems, the layout of welding shops, and the training of welding engineers, foremen and operators.

Research & Development Department

The new laboratories have been established to provide research and development facilities for methods and materials in the electric welding industry, giving a specialised service outside the scope of larger laboratories which are more widespread in their activities. They are housed in a single-storey building, constructed to allow for a second storey when needed. The contractors were A. F. R. Godfrey & Co. Ltd.

The new block is concerned particularly with electrodes; research and development on welding equipment are carried out in separate laboratories. In addition to its activities in developing new electrodes and improving existing products, the Research & Development Department is also responsible for the quality control system, which plays an important part in electrode production at Bilston. Wire, other raw materials, and blended powders for electrode coverings are checked for composition and other features before they are released to production; electrodes are examined and samples tested at several points during manufacture to ensure that consistently reliable products, conforming to close specifications, are always supplied to the user.

Electrode development is constantly in



Operating the Hilger large quartz and glass prism spectrograph in the new Quasi-Arc research and development building

progress in the search for electrodes to weld new materials or having special welding characteristics, and for new and better covering materials. Research work on problems common to the development of a number of electrodes or on basic problems concerned with weldability is also always in hand, either as individual researches carried out by Quasi-Arc, or in conjunction with other laboratories. Service to users of welding is an important part of the work of the Department in investigating problems encountered and imparting advice on materials and techniques.

The eight main laboratories in the new block are for electrode development, chemical analysis, spectrographic analysis, mechanical testing, physical testing, metallography and petrology, X-ray diffraction, and industrial radiography.

LIVERPOOL LIME STREET STATION IMPROVEMENTS.—A new ticket office was opened at Liverpool Lime Street Station, London Midland Region, on April 5, as another stage in the station improvement programme. The new office gives more efficient service and is more convenient, as it replaces three separate offices which will now be removed, thus creating additional circulating space and providing in addition increased facilities for passengers. It forms part of the former North Western Hotel ground floor, and is within the building line of the structure; the effect is to give a considerably wider concourse. The frontage of the ticket office, which contains a total of nine booking windows of the Hygiaphone type, is of modern design in walnut framing, which is surrounded by blue-grey tiles. A new feature to Liverpool is the introduction of the alphabetical system of booking window indication, each window having an internally illuminated sign to direct passengers to their appropriate windows.

PROGRESS OF STEEL TUBE INDUSTRY RECORDED IN FILM.—"The Tubewright," a new film made by Stewarts and Lloyds Limited, outlines the rapid progress made both in manufacturing techniques and in uses of tubular steel. It shows how British engineers of the last century adapted Nature's methods to steel structures, such as the Britannia Tubular and Forth Bridges. Thereafter, for many years, the main obstacle was difficulty in making efficient tube-to-tube connections, and only comparatively recently, when modern metallic arc welding was fully developed, were new advances possible. The film shows the successful application of steel tubes as structural members in bridge-building, crane jibs and materials handling equipment; underlines their growing worth to the building industry, more particularly with modern prefabrication techniques; and records in some detail construction of factories with all-welded tubular steel frames, including that, last year, of the factory at Liverpool of Tubewrights Limited, a subsidiary of Stewarts and Lloyds Limited. Products of the new factory will include roof trusses, bridges, gantries for overhead electric equipment for railways, flood lighting towers, fencing, and materials handling equipment. The film envisages a great future expansion in the use of tubular steel in structural work. It is available for showing free of charge, and through the agents abroad of Stewarts and Lloyds Limited, will have world-wide distribution.

International Combustion (Holdings) Limited

Mr. G. R. T. Taylor on the continued prosperity of the group

The twentieth ordinary general meeting of International Combustion (Holdings) Limited, was held on March 30 in London.

The following is an extract from the review by the chairman, Mr. G. R. T. Taylor, which had been circulated with the report and accounts for the year ended September 30, 1953:—

"The gross profit of the group at £1,640,399 shows a slight improvement upon the results for the previous year. Members are to be congratulated upon the ability of the organisation to maintain such excellent results.

"I expressed my views on the subject of taxation very forcibly last year. The profits of the group for the year under review must suffer the full impact of Excess Profits Levy in addition to income-tax and profits tax. The termination of this levy at December 31 last is a welcome factor which will have a favourable effect upon our net results in the current year, and I hope it will not be too much to expect a further alleviation in the coming Budget.

"The preference dividend and an interim dividend of 5 per cent on the ordinary stock of your company having been paid, the directors have transferred the sum of £250,000 to general revenue and have pleasure in recommending that a final dividend of 15 per cent be paid on the ordinary stock for the year ended September 30, 1953, leaving a balance of £208,818 to be carried forward by the group against the sum of £230,041 brought in from last year.

"Our order book shows no signs of diminution and prospects in this respect are still bright.

"The output of the group continues to increase and must of necessity do so in order to enable us to keep pace with our programme and maintain the delivery requirements of our customers.

Investments in Subsidiary and Other Companies

"Our associated companies abroad and at home continue to prosper. The new company in Pakistan is consolidating its position and is ready to take advantage of any trading opportunities which may arise in that country.

"The operation to transfer the control of our associated Australian company to Australia referred to in my last review has now been completed. The proceeds of the sale of part of our holding in that company will be extremely useful as an addition to our working capital.

"We are in the process of registering a subsidiary company to be named International Combustion (Export), Limited, which will be responsible for all new export work of the organisation as from April 1, 1954, and also a subsidiary company to be named International Combustion Products, Limited, which will as from the same date take over the activities of our operating company, International Combustion Limited, other than the design and manufacture of steam-raising plant which will remain the function of that company. Such activities to be taken over consist mainly of the marketing of mechanical stokers, pulverised fuel burning equipment, grinding, screening and filtering equipment, materials-handling equipment and general engineering.

"Once again I have to pay tribute to the excellent work of the management and

to the co-operation and unstinted effort of all the staff and work-people of the organisation."

The report was adopted.

Secondite and its Uses

The properties and uses of Secondite were shown at a recent demonstration arranged by the Secondite Co. Ltd. Secondite is a name, derived from that of the inventor of the material, which has been given to rice hulls after they have been treated by a patent process. The resultant inorganic substance has a high silica content.

The material has been divided into types A, B, and C; they have different uses but common characteristics in so far as they are fireproof, termite-proof and have insulating qualities possessed by few other materials. Types A and B with suitable binding agents, such as cement and magnesite can be used as building materials. They have also mechanical applications in the protection of internal combustion engines, mobile and fixed tanks and for making filters. Type C has been used for the construction of pavements, wallboards, furniture, containers for corrosive liquids and for many other purposes where fire and acid resistant material is required. When in a dry state the weights are: A, 96 kg.; B, 110 kg.; C, 220 kg. per cu. m. Most of the laboratory and development work has been carried out under the supervision of the inventor.

When mixed with magnesite to make a slab less than 1 in. thick the material cannot be pierced by an acetylene burner nor is heat appreciably transmitted through the slab. When Secondite is used instead of wood to make wallboards they are almost indestructible by fire and can be subjected to intense heat without losing strength.

Explosive Protection

To a tank filled with Secondite, petrol can be added up to 90 per cent of the capacity. The petrol can afterwards be drained or pumped out without any loss. While the petrol and Secondite are in the tank it cannot be exploded. A tank full of petrol and lined with Secondite can be pierced and ignited without risk and a hole in a metal container can be welded without draining off the petrol.

Secondite when mixed with petrol will give off a purified gas of high value in qualities which can be adjusted by the machine using the fuel. From a specially-designed tank a standard petrol engine can be run without a carburettor or petrol pump. The engine will have an appreciably higher power, use less fuel and can be started immediately at low temperatures without mechanical choking. Good results have been achieved by using Secondite for filters.

BARCOCK & WILCOX LIMITED.—The first interest payment on the £4,000,000 4½ per cent 1980 debenture stock of Babcock & Wilcox Limited will be made on March 31 as follows: £2 0s. 4d. per cent on fully-paid stock and £1 14s. 7d. per cent on all other stock.

Proposed Fare Increases in the London Area

Changes in London area passenger fares which will result if the proposal, mentioned editorially elsewhere in this issue, recently placed before the Transport Tribunal by the British Transport Commission take effect are as follow.

The 2d. minimum fare and the 7d. fare

requirements of Mr. J. I. Campbell, Civil Engineer, Eastern Region. The principal contractors for the main installation were W. & C. French Limited of Buckhurst Hill, and G. M. Kenney & Sons Ltd., Ipswich, for the administration building. The total cost of the new depot will be £352,000. It is hoped that the whole of the work will be complete by the end of this year. One difficulty has been that the normal work-

thetically at proposals put forward for real, imaginative improvements.

Mr. Gerald Nabarro (Kidderminster—C.) asked the Minister to bear in mind the great importance of electrification.

Passenger Facilities in Essex

The Minister of Transport & Civil Aviation was asked by the Rev. R. W. Sorenson (Leyton—Lab.) on March 24 whether he would make a statement on plans and proposals to improve passenger transport facilities in the extra-metropolitan Essex areas.

Mr. Alan Lennox-Boyd replied that he had authorised the extension of the Liverpool Street-Shenfield electric line and preliminary work on this had begun. He had also upheld on appeal a proposal for an improvement of road passenger services between Southend and London. He added that it was for the B.T.C. and the other transport undertakings to assess the transport needs of the area and any representations for improvements should be made to them in the first instance.

Royal Commission on Transport

The Minister of Transport & Civil Aviation was asked by Mr. Ellis Smith (Stoke-on-Trent—Lab.) if he would recommend the setting up of a Royal Commission to investigate all transport problems and make a report and recommendations on the need for a comprehensive policy, the modernisation of all forms of transport, methods of reducing costs, and the schemes and localities that should be given priority.

Mr. Alan Lennox-Boyd said that he saw no reason to adopt this suggestion at the present time.

London Transport Committee of Inquiry

Replying to questions by Mr. Reader Harris (Heston & Isleworth—C.), Captain R. E. D. Ryder (Merton & Morden—C.) and Mr. N. J. Cole (Bedfordshire S.—Nat. Lib. C.) on March 31, Mr. Alan Lennox-Boyd said that the Committee of Inquiry into London Transport were making good progress, but he did not think the report would be ready till towards the end of this year.

Mr. Harris inquired if that meant that the report would not be in time to stop any further increases in London Transport fares.

Mr. Lennox-Boyd said that the report clearly must await its time. The B.T.C. had its statutory duties and it would deal with them in a proper constitutional way.

Staff & Labour Matters

Railway Wages Structure

The Chairman of the British Transport Commission, Sir Brian Robertson, arranged to meet representatives of the three railway unions, the N.U.R., A.S.L.E.F., and T.S.S.A., last Wednesday for further discussion of the wage structure for railway operating and clerical staff.

In the talks between the Commission and the unions with a view to correcting anomalies in the wage and salary structure and give added incentives in desirable cases, the three railway trade unions each submitted separate proposals, and after a meeting with representatives of the Commission on April 1, the A.S.L.E.F. had threatened to call a strike of its members on April 24 unless the Commission's proposals in connection with the new wages structure were tabled for full examination.

The A.S.L.E.F. stated that its proposals

Mileage.	From.	To.	Railway.	Existing Fare.	Proposed Fare.
Day Return Fares—Third Class					
5	Kings Cross	Wood Green	B.R. (E.R.)	s. d. 1 5	s. d. 1 6
30½	Guildford	Waterloo	B.R. (S.R.)	7 8	7 10
Early Morning Return Fares—Third Class					
15	Harold Wood	Liverpool Street	B.R. (E.R.)	2 4	2 6
35½	Southend Central	Fenchurch Street	B.R. (E.R.—L.T.S.)	3 7	3 9
10	Southgate	Piccadilly Circus	L.T.E.	1 7	1 9
Weekly Season Tickets—Third Class					
12½	Romford	Liverpool Street	B.R. (E.R.)	15 0	15 6
6½	Palmer's Green	Kings Cross	B.R. (E.R.)	10 0	10 9
5½	Hammersmith	Charing Cross	L.T.E.	7 6	8 3

remain unchanged, but the present 3½d. fare will be increased to 4d., the 5d. fare to 6d. and 8½d. fare to 9d. Fares from 10d. upwards will be increased by 1d. No individual single fare will be increased by more than 1d.

Early morning single fares by road will be increased by 1d. except for the 2d. fare, which remains unaltered. Rail early morning return fares will be increased to preserve equality of fares for the return journey by road or rail, but no early morning rail return ticket will be increased by more than 2d.

Rail Season Tickets

Rail season tickets will be increased by 2s. on all monthly rates above one mile, with proportionate increases on weekly and quarterly rates. All fares on Green Line services will be raised by 1d. and the present minimum fares of 1s. 1d. for built-up areas and 10d. outside those areas will be increased to 1s. 2d. and 11d. respectively.

Examples of the proposed increases are given above.

New Motive Power Depot at Ipswich

The administrative block of a new motive power depot at Ipswich was opened on April 5 by Mr. C. K. Bird, Chief Regional Manager, British Railways, Eastern Region. The new building comprises offices, new stores, ablutions, mess room, and other amenities for the staff of some 500 employed at the depot.

The old Ipswich Motive Power Depot being out-of-date, difficult and uneconomic to work, a modest scheme of modernisation was started in 1938 but had to be deferred on the outbreak of war. After the war it was decided to undertake a complete scheme of modernisation and reconstruction; work started in October, 1951.

Ipswich is one of the main depots in the Norwich Motive Power area. Sixty-nine locomotives are permanently allocated and the administrative facilities have been provided on the basis of approximately half the total staff of 500 being on duty at any one time.

The new block was constructed to the

ing of the depot has had to be maintained with rebuilding in progress.

Others present at the ceremony included:—

Messrs. E. D. Trask, Motive Power Superintendent; L. P. Parker, retired Motive Power Superintendent; J. S. Jones, Assistant Motive Power Superintendent; H. H. Powell, Architect; M. B. Thomas, Public Relations & Publicity Officer; A. T. S. Rayner, Welfare Officer, Eastern Region; and Mr. J. L. Salmon, Regional Editor, *British Railways Magazine*;

Messrs. R. L. Vereker, District Motive Power Superintendent, Norwich; R. E. Lawler, District Commercial Superintendent, and W. Grant, District Engineer, Ipswich.

Questions in Parliament

Automatic Train Control

The Minister of Transport & Civil Aviation was asked by Viscountess Davidson (Hemel Hempstead—C.) on March 31 whether he would make a further statement upon progress with automatic train control arrangements on British Railways.

Mr. Alan Lennox-Boyd said that the B.T.C. was making vigorous efforts to develop the apparatus to the necessary standard of reliability, and large-scale trials were now in progress, but it might still be some time before the Commission and the Chief Inspecting Officer of Railways were satisfied that the necessary standard had been achieved.

Modernisation of the Railways

The Minister of Transport & Civil Aviation was asked by Mr. Ellis Smith (Stoke-on-Trent—Lab.) on March 31 to state the amounts of approved capital expenditure to be spent on the modernisation of railway transport during the next few years.

Mr. Alan Lennox-Boyd replied that the B.T.C. had in hand various modernisation schemes for the railways which would come to fruition in the next few years. The Commission was making a fresh review of the whole question of modernisation, and if its requirements for capital expenditure under this head. He was in constant touch with Sir Brian Robertson on this question and they both had great faith in the future of the railways. He would look sympa-

were submitted on January 7, but that no progress had been made, although four meetings had been held since the December wages settlement.

The N.U.R. is asking for an increase of 10s. 6d. in the rate of pay of the minimum rated worker, i.e., from 124s. 6d. to 135s. per week. Before last December the minimum rate was 117s. 6d. a week. This was increased by 4s. a week from December 6, with a further increase of 3s. from January 24, giving a total increase of 6 per cent since December 6. The further increase of 10s. 6d. would mean an increase of 14.9 per cent since the beginning of December last, approximately the level of the union's original claim of 15 per cent.

It is understood that at a meeting of the N.U.R. executive in London on April 5 it was made clear that the union was not in favour of the threatened strike action on the part of the A.S.L.E.F. It decided instead to seek an immediate meeting with Sir Brian Robertson in an attempt to avert another rail crisis, and has indicated its intention to insist on an increase for the lowest-paid worker as a basis for the new wage structure.

Railway Shopmen

At a further meeting of the Railway Shopmen's National Council held on April 5, the employees' side of the council undertook to recommend to their respective executive committees (of the N.U.R. and of unions affiliated to the C.S.E.U.) for acceptance the offer that the rates of pay of railway shopmen be increased by 8s. for skilled, 7s. 6d. for semi-skilled, and 7s. for unskilled men, with corresponding adjustments for juniors and females.

The cost of the increase is estimated at £2,500,000 a year.

Contracts & Tenders

An order for 25 16-ton all-steel mineral wagons has been placed by Guest, Keen, Baldwins Iron & Steel Co. Ltd., with the Cambrian Wagon & Engineering Co. Ltd.

British Railways, London Midland Region, have placed the following contracts:—

Jeffrey & Sons Limited, Birmingham: accommodation for parcels office staff at Birmingham

Gee, Walker & Slater Limited, London, W.1: claims office annexe at Broad Street Goods Depot, London

The High Commission for India is inviting tenders for locomotive fireboxes. Details appear under official notices on page 423.

The Special Register Information Service, Export Services Branch, Board of Trade, has issued circular No. ESB/6259/53 (GEN/1216) of March 31, setting forth notes prepared by the United Kingdom Trade Commissioner Service in India, on the subject of the procedure for calls for tenders issued by the Governments and other authorities in India.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:—

- (a) 14,000 hook shackle for screw coupling (b.g.)
- (b) 391 cases buffer (b.g.)
- (c) 10 Teloc speed indicator and recorder

RT835 for "HP" class locomotive or similar as per specification shown below:—

- (i) graduated 0-60 m.p.h. with 24-hr. click and total distance counter
- (ii) 10 mm. diameter flexible shaft with steel-lined outer cover 4,500 mm.
- (iii) gearbox ratio 51:26 with crank and short bracket

Tenders are to be submitted to the Director-General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting reference SRI/16151-E/III for (a); SRI/16093-D/III for (b); SRI/19847-D/II for (c). They will be received up to 10 a.m. on (a) April 15, (b) April 23, (c) April 28.

Forms of tender are only available for purchase in India from: Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi, Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the basis of advance quotations already submitted.

A copy of the tender forms can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch and the drawings can be seen at the offices of Hodges Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained at a fixed price per sheet.

The Director General of Supplies & Disposals, New Delhi, is inviting tenders for:—

- (a) 870 spindle buffer plunger (b.g.)
- (b) assorted pedestal shoe liners
- (c) assorted steam pipe elbows; 428 brake hanger compensating beam bracket; 234 tender bogie top centre; 166 tender bogie centre plate; 21 tender drag box front
- (d) 70 wheel centres rough (two items) machined cast steel
- (e) 1,000 wheels (chilled c.i.) 23 in. dia.

Tenders are to be submitted to the Director General of Industries & Supplies, Shahjahan Road (Section SRI), New Delhi, quoting references:—

- (a) SRI/17288—D/III;
- (b) SRI/17145—D/I(a);
- (c) SRI/16213—E/II;
- (d) SRI/16181—E/I;
- (e) SRIA/16203—E/I

They will be received up to 10 a.m. on April 12 (a); April 14 (b); April 15 (c); April 15 (d); April 20 (e). Forms of tender are only available for purchase in India from the Deputy Director General (Supplies), Directorate General of Supplies & Disposals, New Delhi; Director of Supplies & Disposals, Bombay or Calcutta; Deputy Director of Supplies & Disposals, Madras.

If the date for the receipt of tenders does not allow sufficient time for tenderers to obtain tender forms from India, they may submit their quotation to India in their own letter form or by telegram so long as all essential particulars are given and provided they simultaneously apply for the tender forms and return them duly completed as quickly as possible on the

basis of advance quotations already submitted.

A copy of the tender form in respect of (a) and (c) can be examined at the India Store Department, 32-44, Edgware Road, London, W.2, on application to the "CDN" branch and the drawings may be seen at the offices of Hodges, Bennett & Company, 59-60, Petty France, London, S.W.1, from whom copies may be obtained at a fixed price per sheet.

The Special Register Information Service, Board of Trade, Export Services Branch, states that the United Kingdom Trade Commissioner at Johannesburg reports that the Stores Department, South African Railways, is calling for tenders for two electric motor-driven, water-cooled, rotary vacuum exhausters, one machine for testing tender braking systems in tender repair shop, and one machine for a vacuum brake gear testing plant. The exhausters are to be capable of a suction volume capacity of 120 cu. ft. of rarified air per minute at 20 in. Hg. when working at 5,000 ft. above sea level.

Tenderers are to note that an automatic cut-out device is not required, but a snifter (vacuum relief) valve which can be set to open at any desired pressure and a non-return valve are to be supplied. The machines must be supplied complete in all respects, with motor, starter, flexible coupling, common base plate for mounting the exhauster and motor, force feed mechanical lubricator, vacuum gauge exhauster silencer, discharge non-return valve, pipeline filter and standard equipment, which must be specified in detail by tenderers. Any extras which can be supplied are to be offered, but must be detailed and quoted for separately.

The closing date for the receipt of tenders is April 25. Tenders must be enclosed in a sealed envelope inscribed on the outside—"Tender No. F.7571: Rotary Vacuum Exhausters," and addressed to the Chief Stores Superintendent, P.O. Box 8617, Johannesburg." A copy of the tender documents including specifications and conditions of contract is available for loan to United Kingdom firms in order of application to the Export Services Branch, Lacon House, Theobalds Road, W.C.1.

HEAD, WRIGHTSON & CO. LTD.: OVERSEAS DEVELOPMENTS.—Competition in overseas markets was a main theme at a recent press conference arranged by Head, Wrightson & Co. Ltd. at Thornaby-on-Tees, during a sales conference of the management and sales representatives of the firm. Sir John Wrightson, Vice-Chairman & Deputy Managing Director, said that they were entering a buyers' market, and must ensure contact between their sales and design and production staff. He referred to expansion of the company's activities in South Africa; in Australia (where they now had a company, registered in New South Wales, connected with the established business of Gibson, Battle & Company); in Canada (the new Toronto office); and in India, where they had just received their first order after opening their Calcutta office. Sir John Wrightson referred also to developments in the steel industry in Britain; when the firm's programmes were complete, they should be better able to meet the expected Continental competition. Whilst they must not underestimate German and Japanese competition, they should hold their own provided production costs did not rise.

Notes and News

Toronto Underground Railway.—In the report of the opening of the Yonge Street Subway, Toronto, given in our April 2 issue, Mr. A. B. B. Valentine should have been described as Member, London Transport Executive.

Chief Draughtsman Required.—A chief draughtsman with experience with electric and diesel locomotive design an advantage but not essential, is required by an engineering concern. See Official Notices on page 423.

Vacancy for Design Engineer.—Applications are invited for the post of design engineer required for development of structures for overhead electrical transmission lines, railway electrification, aerial ropeways and floodlight towers. See Official Notices on page 423.

Disposal of Road Haulage Units.—The Road Haulage Disposal Board and the British Transport Commission have announced that List No. 5 of transport units will be advertised on April 28. This will contain a number of units composed of heavy haulage, furniture, tanker, and contract hire vehicles, most of which have been offered before in other forms. There will be approximately 650 units and 2,050 vehicles. List R.2 advertised on April 7, consists entirely of units previously offered but not sold. About 215 units and 1,800 vehicles are involved.

Improved Refreshment Facilities at Brighton Station.—A cafeteria service and lounge bar at Brighton Station, Southern Region, were opened to the public on March 25. A cafeteria counter has been installed for the service of tea, coffee, snacks, and hot meals, and the lounge bar has direct entrance from the front of the station. The bar is carpeted, curtained, and furnished with armchairs and tables, and decorated in primrose and sycamore, with a blue relief. The cafeteria and adjoining buffet have a marble floor, a feature being the Venetian glass decorative treatment behind the cafeteria counter.

Improved electric lighting has been installed throughout. The kitchen premises include a modern washing up room provided with a Euk mechanical plate and cup washer supplied by the Euk Catering Company.

British Railways, Southern Region, Lecture & Debating Society: Visit to York.—The visit to York of the British Railways, Southern Region, Lecture & Debating Society, will now take place on Friday, April 30, and not on April 9, as originally arranged.

Institute of Transport: New Section in Western Australia.—The Council of the Institute of Transport has approved the formation of a new Section of the Institute in Western Australia. This brings the number of Sections in Australia to four: New South Wales, Victoria, Queensland and Western Australia.

British Railways Coal, Iron and Steel Traffic.—British Railways carried 233,719 tons of iron and steel from the principal steelworks and 346,900 tons of iron ore during the week ended March 27, compared with 208,573 tons and 345,000 tons in the corresponding period last year. During the week ended 6 a.m. on April 5, 3,260,190 tons of deep-mine and opencast coal were conveyed, including 384,780 tons cleared during the weekend.

"Queen Elizabeth Slept Here."—On Tuesday last, the Southern Railway Dramatic Society gave an excellent performance of Talbot Rothwell's play "Queen Elizabeth Slept Here," at the Scala Theatre, London, W.1. This society has a high reputation for the good work that it does, not only at the Scala but in other parts of the country. Mr. Eric Simons is to be congratulated on the production and also on his performance during the play. The leading parts were well taken by Miss Eileen Amor and Mr. Antony Prior and they were admirably supported by Mr. Brian Davies, who gave a good character study, as also did Miss Adela Durant. Mr. Lionel Durant, and Mr. Roy Brighton were well cast in their respective roles and Miss Brenda Yates,

Mr. Russell Wildman and Miss Kitty Hutchinson all contributed to a smooth production. Miss Grace Holland and Miss Peggy Pearce completed a cast which added to the reputation of the Society.

Imperial Chemical Industries Limited.—An announcement has been made by Imperial Chemical Industries Limited of the final figures for the issue of £30,000,000 of 4½ per cent unsecured loan stock. Of the 52,821 applicants for £304,582,800 of stock, 30,092 were for amounts between £50 and £500. Each of these applicants will be allotted £50. For applications for less than £1,000,000 the allotment will be 10 per cent and for applications over £1,000,000 it will be about 8½ per cent.

American Travel Agents Entertained.—Mr. David Blee, Chief of Commercial Services of the British Transport Commission, and Sir Alexander Maxwell, Chairman of the British Travel & Holidays Association, on Saturday evening entertained at the Charing Cross Hotel, London, W.C.2, a group of American travel agents who have been touring the United Kingdom to assess the amenities available to American tourists during the coming season. A number of officers of the British Transport Commission and of the British Travel & Holidays Association were present. Mr. David Blee and Sir Alexander Maxwell welcomed the guests and expressed hope that their tour had been comfortable, interesting and informative and that as a result they would be able to commend Great Britain as a tourist centre to their fellow countrymen.

G.W.R. Special Trainees' 23rd Reunion.—The arrangements this year for the G.W.R. Special Trainees' 23rd Reunion, which took place in the Great Western Royal Hotel, Paddington, W.2, on April 2, in accordance with past practice, were in the hands of the 1923 group of trainees and the Chairman was Mr. D. H. Dillow who retired recently from service with the Malayan Railway. The function was attended by 34 members of the old training scheme. The toast of British Railways was proposed by Sir Reginald Robins, one of the earliest of the trainees, who retired



(Left) general view of new cafeteria, and (right) lounge bar, at Brighton Station

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is exempted from the provisions of the Notification of Vacancies Order, 1952.

DESIGN ENGINEER required for development of structures for Overhead Electrical Transmission Lines, Railway Electrification, Aerial Ropeways, Floodlight Towers, etc. Successful applicant, who should have had a thorough theoretical training and practical experience in the design and application of these structures, would be expected to control and organise his own Department. Good prospects are offered to a man of initiative and resource. Box 175, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

R. P. ATKINSON & CO., 12, Waterloo Road, Wolverhampton. Phone Wolverhampton 23617. Steel Bars, Flats, Sections and Sheets, traction and colliery equipment. Enquiries invited.

R. P. ATKINSON & CO., Consulting Engineers & Agents, 12, Waterloo Road, Wolverhampton. Phone Wolverhampton 23617. Drawing office work:—electrical, mechanical, and traction equipment also jig and tool design. Layouts and full detail work to clients specifications.

CHIEF DRAUGHTSMAN for important Engineering concern, experience with electric and diesel locomotive design an advantage but not essential. Candidates must have first class practical mechanical experience. Starting salary £1,200 to £1,500 with superannuation. Box 173, *The Railway Gazette*, 33, Tothill Street, London, S.W.1.

THE HIGH COMMISSIONER FOR INDIA invites tenders for the supply of: **STEEL FIREBOXES FOR MAWD CLASS LOCOMOTIVES.** No. 12. Steel inner Firebox. Welded construction for MAWD Class Locomotives, for coal burning, working pressure 185 lb. per sq. inch, with tube and flue tube holes drilled. Set 1. Mechanical copies on tracing linen of the Firebox as made. Forms of tender may be obtained from the Director General, India Store Department, 32/44, Edgware Road, London, W.2, on or after April 9, 1954, at a fee of 10s. which is not returnable. Cheques to be made payable to "High Commissioner for India." Tenders are to be delivered by 2 p.m. on Friday, May 7, 1954. Please quote reference No. 368/53.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press, Limited, 33, Tothill Street, London, S.W.1.

recently from the post of Commissioner for Transport, East Africa High Commission. Mr. S. C. Harvey replied. The toast "Colleagues Overseas and Colleagues in Industry" was proposed by Mr. E. Havers, Assistant (Mineral) to the Commercial Superintendent, British Railways, Western Region, and was responded to by Mr. R. M. L. Lemon, Chief Establishment Officer, East African Railways & Harbours, at present on leave in this country.

Welsh Railwaymen's Savings Club.—A National Savings club, which already has 200 members, has been formed among the staff in a large area of the Western Section of British Railways, with Portmadoc as headquarters. The scheme embraces civil engineering, clerical, motive power, and operating grades.

To Blackpool by Observation Car.—The London Midland Region recently organised a number of journeys of an unusual nature to Blackpool. Some 300 engine drivers and guards have been taken in parties to brush up their knowledge of the routes concerned in time for the summer working. An observation car, pushed in front of the engine, has been used to ensure an uninterrupted view and stops have been made at the more important junctions to enable a detailed examination of the signals to be made.

Twiner Pipe Flanging Jig.—A new pipe flanging jig designed to meet the problem of ensuring accurate squareness of slip-on pipe flanges to the bore of pipes before welding has been evolved by Donald Ross & Partners Limited. The jig is inserted into the bore of the pipe after the flange has been pushed over the pipe, and by turning a tommy bar a series of links are expanded to press against the inside wall of the pipe. The flange is secured by two bolts to the clamping plate and tack welded on the outside. The jig is then removed and internal and external welding is carried out in the normal manner. The Twiner jig is of all-steel construction and is manufactured in five sizes to suit pipes ranging from 2 in. to 18 in. bore.

Hale & Hale (Tipton) Limited at the B.I.F.—A representative range of castings in high quality malleable iron and in Permalite for a wide variety of industries, including vehicle manufacture, mining, civil engineering, railways, machine tools and so on will be exhibited by Hale & Hale (Tipton) Limited at the forthcoming British Industries Fair at Castle Bromwich. Improved facilities for large-scale production will facilitate better deliveries of orders placed at this year's B.I.F. for castings both in Blackheart malleable iron and in Permalite. Blackheart malleable iron is made in accordance with B.S. 310/57, grade 3, and

Permalite is the special-purpose high-duty alloy designed for hard wear and resistance to shock and abrasion. It has an ultimate tensile strength of 33-35 tons p.s.i., a yield strength of 20-22 tons p.s.i., elongation of 6-8 per cent, bend of 90 deg. and a Brinell value of 175. Railway equipment exhibits will include permanent way fittings, spring housings, and carriage and wagon components.

Institute of Transport: Tees-Side Section Annual Dinner.—The Annual Dinner of the Tees-Side Section of the Institute of Transport took place at the Scotch Corner Hotel, Middleton Tyas, Richmond, on Friday, March 26. Sir Gilmour Jenkins, Vice-President & President-Elect of the Institute of Transport, responded to the toast "The Institute of Transport," proposed by Mr. W. V. Golding, graduate. The toast of "The Guests" was proposed by Mr. E. C. Tuff, Chairman of the Darlington Group, and Mr. J. A. T. Hanlon, Chairman of the Licensing Authority for the Northern Traffic Area, responded. The Chairman of the Tees-Side Section, Mr. J. E. Peacock, presided.

Birmingham Railway Carriage & Wagon Co. Ltd.—An ordinary dividend of 10 per cent is recommended by the Birmingham Railway Carriage & Wagon Co. Ltd., for 1953. This is the same as that for 1952. After tax provision of £115,750 (£150,000) net profits were £81,344 (£110,570). A sum of £25,000 (£17,468) is added to the balance for tax over-provision in previous years as is £39,312 from E.P.T. post-war refund reserve. The stock and contingencies reserve is allocated £85,000 and £100,000 has been transferred from that reserve as a provision to reduce the value of stock and work in progress for expenditure which will not be fully recovered. There is no allocation to general reserve which received £70,000 in 1952. £141,169 (£138,316) is carried forward.

Overhaul of Caisson Gate of King George V Drydock, Southampton.—The operation of removing and drydocking for major overhaul the caisson gate of the King George V drydock at Southampton has been completed. The caisson is now in No. 3 drydock for repairs, renewal of the greenheart timber meeting faces, and examination, cleaning and painting of all interior and exterior steelwork not normally accessible. It was originally intended to dock the caisson in No. 6 (Trafalgar) Drydock, where it could have been cradled in its normal upright position, but this would have meant that for a time, the two largest drydocks at Southampton would have been out of action. It was, therefore, decided to put the caisson into one of the smaller drydocks, No. 3, which necessitated the caisson being turned over on its back

in a horizontal plane, with a draught of 13 ft. compared with 31 ft. 9 in. in the upright position. This scheme leaves Nos. 5 and 6 Drydocks free for all the large vessels which normally drydock in Southampton with the exception of the two "Queens." The principal dimensions of the caisson are: 141 ft. 9 in. long, 29 ft. 6 in. wide, and 58 ft. 6 in. high.

New London Midland Region Posters.—The Public Relations & Publicity Department of the London Midland Region has produced three new posters, "Llandudno," "Portrush," and "Chester Cathedral." The first-named is a pictorial map reproduced from the original by E. W. Fenton by chromo-litho in 12 colours. Charles King's painting of Portrush was reproduced similarly in 11 colours. The photo-litho printing in six colours of Felix Kelly's painting of the interior of Chester Cathedral admirably brings out the variety of colour of the original.

Institute of Transport: Scottish Section Annual Dinner.—The annual dinner of the Scottish Section of the Institute of Transport took place at the North British Hotel, Edinburgh, on Wednesday, March 24. (Mr. D. R. Lamb, Past President, deputising for the President, responded to the toast of "The Institute of Transport" proposed by General Sir Brian Robertson, Chairman of the British Transport Commission. The toast "The City of Edinburgh" was proposed by Sir Reginald H. Wilson, Member of Council of the Institute and Member of the British Transport Commission, and the reply was given by Sir James Miller, Lord Provost of Edinburgh. The toast "The Chairman" was proposed by Councillor R. McLaughlin, Chairman of the City of Edinburgh Transport Committee, and the Chairman of the Section, Mr. W. M. Little, responded.

Associated Commercial Vehicles Limited.—At the annual general meeting of Associated Commercial Vehicles Limited, Lord Brabazon of Tara, Chairman, presiding, said that the surplus on trading of £1,984,319, was £140,000 greater than last year. There had been reduced sales overseas and an increase at home. A final dividend of 12½ per cent, making 22½ for the year, was proposed. The Chairman referred to his visit to Canada where he discussed with their associates the Canadian Car & Foundry Company, the possibility of extending their market in that territory. Besides delivering many diesel trains to Ireland and Western Australia they had manufactured an experimental lightweight diesel train which had undergone successful trials on all Regions of British Railways; its economy and ease of operation and maintenance augured well for its future on branches otherwise re-

garded as unprofitable. Enquiries being received by the diesel train division of British United Traction Limited, a company owned jointly by Leyland Motors Limited and themselves, promised that considerable expansion could be expected in this sphere.

Jonas Woodhead & Sons.—At the annual general meeting of Jonas Woodhead & Sons, Captain Allan Kyle, Chairman, said that in the year up to September 30 last they had created a new record in output, increased export markets and reached a higher-level of trading profit. On the other hand, of a taxable revenue of £198,675, no less than £144,154 had to go to the Exchequer. Their associated South African companies had become subsidiaries and they were now the largest manufacturers of road and rail spring suspensions in that country.

G. A. Harvey & Co. (London) Ltd. at the B.I.F.—G. A. Harvey & Co. (London) Ltd. exhibits at the forthcoming British Industries Fair at Castle Bromwich, will include filing and card index cabinets; lockers, tables, and other office equipment, together with adjustable storage bins and shelving. An important new feature of the various products is that the main items can be exported in knocked-down condition, while assembly can be performed very easily. Heavier products manufactured by the firm, high-pressure autoclaves up to 300 lb./sq. in., fractionating columns weighing some 220 tons, gas oil separators made from 3 in. thick mild steel plate, 4 ft. 6 in. long by 170 ft. long, turbine casings up to 28 tons weight together with cement drying kilns, engine frames and so on, will be portrayed by a number of photographs.

Forthcoming Meetings

- April 10 (Sat.).—Railway Students' Association. Afternoon visit to Longmoor Camp and the military railway.
- April 10 (Sat.).—Stephenson Locomotive Society, at 32, Russell Road, Kensington, W.14, at 3 p.m. Annual General Meeting.
- April 10 (Sat.).—Stephenson Locomotive Society, Scottish Section, at the British Railways Offices, Buchanan Street, Glasgow, at 3 p.m. Paper entitled "Modern Dynamometer Car Testing," by Mr. O. S. Nock.
- April 12 (Mon.).—Historical Model Railway Society at the headquarters of the Stephenson Locomotive Society, 32, Russell Road, London, W.14, at 7 p.m. Talk on "The London, Tilbury & Southend Railway," by Mr. N. McCracken.
- April 13 (Tue.).—Institution of Civil Engineers, at Great George Street, Westminster, London, S.W.1, at 5.30 p.m. Paper on "Extension at Takoradi Harbour," by Messrs. A. J. Clark and H. A. Broughton.
- April 14 (Wed.).—Institution of Railway Signal Engineers, at the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C.2, at 6 p.m. Annual General Meeting.
- April 14 (Wed.).—Stephenson Locomotive Society, Midland Area, at 71, Edmund Street, Birmingham, at 7.15 p.m. Ciné film show: "Rail tours and special trains of 1953," by Mr. W. A. Camwell.
- April 15 (Thu.).—Diesel Engine Users Asso-

ciation at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Annual luncheon.

April 20 (Tue.).—Stephenson Locomotive Society, Coventry Centre, at the B.T.H. Social Rooms, Holyhead Road, Coventry, at 7.30 p.m. Ciné films, "Railway scenes old and new," by Mr. H. J. Stretton Ward.

April 21 (Wed.).—Institution of Locomotive Engineers, at the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, S.W.1, at 5.30 p.m. Paper on "Locomotive diagramming and utilisation," by Mr. L. C. Welborn.

April 24 (Sat.).—British Railways, Southern Region, Lecture & Debating Society, Morning visit to the National Physical Laboratory at Teddington.

April 26 (Mon.).—Institute of Transport, Berks, Bucks & Oxon Section, at 22, Thorn Street, Reading, at 7 p.m. Paper on "Transport in industry," by Mr. J. H. Criddle, followed by annual general meeting.

April 27 (Tue.).—Institute of Transport, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 12.30 for 1 p.m. Informal luncheon.

April 28 (Wed.) to May 1 (Sat.).—Institute of Welding, Spring Meeting, in South Wales and Bristol.

April 30 (Fri.).—Stephenson Locomotive Society, North Western Centre, at the Liverpool Engineering Society's Rooms, Dale Street, at 7.45 p.m. Illustrated lecture, "Great Northern cavalcade," by Mr. R. A. H. Weight.

April 30 (Fri.).—British Railways, Southern Region, Lecture & Debating Society, Visit to York.

May 1 (Sat.).—Stephenson Locomotive & Manchester Locomotive Societies, at 2.15 p.m. Special train tour from Preston to Longridge, Knott End Railway, Glasson Dock, Sandisle, etc.

May 1 (Sat.).—Permanent Way Institution, East Anglia Section. Visit to Lowestoft Harbour Works and Sleeper Depot.

Railway Stock Market

Strong and active markets, inspired by hopes of Budget tax reductions, put many industrial shares up to new high levels for the year on Monday, and good gains were also recorded by British Funds. Best levels were not fully held, because profit-taking developed on the view that, whatever the Budget might bring, stock markets were likely to react temporarily after their big advance. Many shares reached levels which appeared to discount best Budget hopes. It was assumed that tax concessions would increase the tendency for companies to be rather more liberal in dividend payments. On the other hand, some of the dividend estimates now current in the market seem on the optimistic side. Unless profits have recorded a good rise, it would be necessary to reduce allocations to reserves if highest dividend hopes were realised.

A main feature in foreign rails has been renewed demand for Manila Railway stocks on the assumption that a settlement in respect of the very considerable arrears of interest on the company's holding of Manila Railroad bonds may be negotiated in the next few months. This was after news that representatives of the Philippine Government are to visit London to discuss the position of the Railroad Company. The question of the Railroad Company's debts may have come to a head, because, if as is believed the U.S.A. is to finance modernisation and rehabilitation of the railway, settlement of the arrears on the Railroad Company's bonds will be necessary in the first place. On this assumption, Manila Railway "A" and "B" debentures have risen 2 points to 84½ and 74½ respectively, while the preference shares gained 1s. at 9s. 9d. and the ordinary shares rallied to 4s. 6d.

Antofagasta ordinary stock changed hands around 7½ and the preference stock around 40. San Paulo units were 5s. 3d. and in other directions, Nitrate Rails shares firmed up to 20s. 9d. after an earlier small decline.

United of Havana income stock was steady at 43½, with the consolidated stock 6½.

Canadian Pacifics have been more active around \$45, while the 4 per cent preference stock and 4 per cent debentures were firmer at £65½ and £89 respectively. White Pass no par value shares received more attention around \$26½; the convertible debentures rallied to £92 and the loan stock was £33½.

Among Dominion and Colonial rails, Midland of Western Australia showed revived activity with business ranging from 22 to 24. Emu Bay 5 per cent. debentures marked 20½. Nyasaland 3½ per cent debentures have been dealt in at 80½.

Dorada Railway ordinary was less active and quoted at 71 with the first debentures at 90. Guayaquil & Quito 5 per cent. debentures quietened down after their recent activity and were quoted at 53.

Road Transport shares have been rather more prominent, with West Riding 33s. 9d., Southdown 30s. 6d. and Lancashire Transport 46s. 6d. Devon General were 27s. 6d., East Kent 24s. 6d., Ribblesdale 36s. 3d. and Potteries Motor Traction 28s. 9d. Buyers were about before the Budget on hopes of a reduction in the petrol and fuel tax. B.E.T. 5s. "A" units showed steadiness at 42s. 9d.

Engineering and kindred shares reflected the general market trend, though best levels were not held. Vickers attracted up to 56s. 3d. on hopes of an increase in the forthcoming dividend. Babcock & Wilcox moved up to 51s. 6d. and John Brown to 39s., the good yield on the latter attracting attention. Elsewhere, Reyrolle advanced to 75s. 9d. after news of the results and increased distribution. Higher dividend possibilities put Guest Keen up to 58s. In other directions, Tube Investments moved up to 64s. 9d., T. W. Ward rallied to 88s. 6d., and Ruston & Hornsby to 46s. 9d., though elsewhere Blaw Knox moved back to 34s. after the results. British Aluminium at 36s. 3d. remained under the influence of the lower dividend. The better trend in engineering and kindred shares was due to the official emphasis on the need for industry to give much more attention to installing new plant and equipment so as to cut production costs and help export trade.

The shares of locomotive builders and engineers also attracted increased attention. Beyer Peacock were 36s. 7½d. and Charles Roberts 5s. shares 9s. 7½d. Birmingham Railway Carriage were 29s. 1½d. after publication of the full results and chairman's annual statement. At Glasgow, Hurst Nelson eased to 41s. North British Locomotive rallied to 15s. 10½d. Vulcan Foundry at 25s. 9d. have not kept best prices, though Gloucester Wagon 10s. shares improved further to 17s. 3d. Wagon Repairs 5s. shares were 12s. 6d. and G. D. Peters 5s. shares 23s. 9d.